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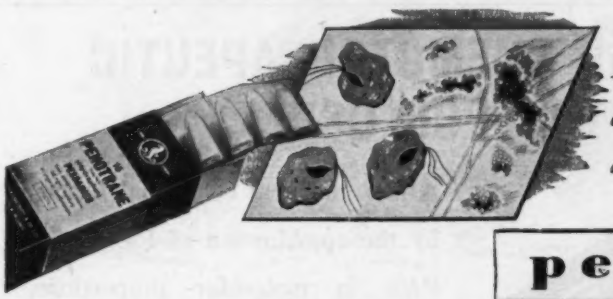

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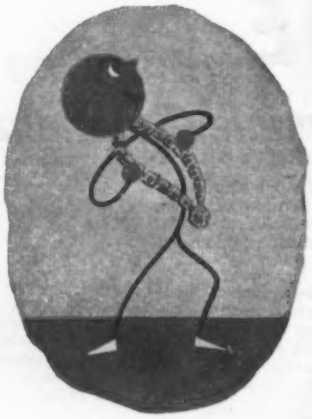

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ALUDROX Amphoteric Gel occupies a pre-eminent position in the successful medical treatment of the peptic diathesis. In neutralising acid, partially inactivating *pepsin*, and encouraging *mucosal resistance*, it deals rapidly and effectively with three of the main factors incriminated in the genesis of gastro-duodenal ulceration.

Aludrox Gel is presented in 6-oz. and 12-oz. bottles.

Aludrox Tablets are presented in boxes of 60 13-grain tablets.

Aludrox

'Aludrox' is the registered trade mark of

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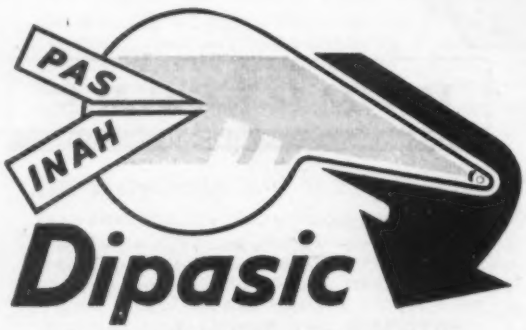
Wyeth

A *NEW* ORAL CHEMOTHERAPEUTIC FOR TUBERCULOSIS



Tablets of 100 mg. of Isonicotinic acid hydrazide-p-aminosalicylate.

A new chemical compound formed by the combination of INAH and PAS in molecular proportions.

Literature on therapy and dosage on request,

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Bengue & Company Ltd. make "Dipasic" available in the United Kingdom by arrangement with Ed. Geistlich Sons, Ltd., Wolhusen (Switzerland).

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The scientific, cultural and commercial organization of a Pharmaceutical House with more than a century of experience assures Physicians and Scientists of an ever prompt and efficient co-operation in the eternal struggle for the health of Mankind.

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Simple, effective contraception
where secondary occlusive methods
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BRAND OF PHENYLBUTAZONE

BUTAZOLIDIN is notable in the treatment of arthritic conditions. In a great many cases it affords marked subjective relief of symptoms with objective evidence of improvement. The long-term response to low maintenance dosage is particularly impressive.

Availability.

Tablets containing 100 mg. and 200 mg. for oral administration, and in solution for injection in ampoules of 5 ml. containing 1,000 mg.

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Prl.80
9

New research on Procidets proves their amazing effectiveness in the treatment of streptococcal and other throat infections

Newly evolved techniques have convincingly established the value of PROCIDETS in practice.

It has been demonstrated that four Procidets sucked in succession destroy most of the bacteria and fungi in the mouth.

PROCIDETS were evolved to obviate the danger of undesirable use of antibiotics, which develops resistant strains of bacteria—a danger now generally recognised.

PROCIDETS are fully effective against bacterial and fungal infections of the throat and mouth and yet contain no antibiotic. They are non-toxic and cannot build up resistant strains.

Procidets v Penicillin

Comparitive effect on ORAL BACTERIA

Before *After 1 Procidets* *After 4 Procidets*

These photographs are of representative plates showing the dramatic action of Procidets in comparison with Penicillin Lozenge B.P.

Before *After 1 Penicillin Lozenge B.P.* *After 4 Penicillin Lozenges B.P.*

Each 1 gramme lozenge contains :

Cetyl Pyridinium Chloride	*4 mg.*
Sodium Propionate B.P.C.	*100 mg.*
Benzocaine B.P.	*5 mg.*

Cartons, 18 lozenges, metal foil sealed pack.
Retail price 2/4 (incl. P./tax).
Basic N.H.S. cost 1/4 per carton.
Also available dispensing pack 498 lozenges for N.H.S. patients PROCIDETS prescribable on Form EC10.
Classification category 3/4.

Procidets

Literature and samples on request

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Correct vitamin balance for all ages

From the youngest to the oldest the routine administration of **ABIDEC*** ensures an adequate intake of vitamins in well-balanced proportions.

For infants and children Abidec **DROPS** are the ideal supplementary multivitamin treatment. For adults Abidec **CAPSULES** are invaluable in correcting suspected deficiencies due to bad dietary habits.

ABIDEC

**Trade Mark*

Abidec Drops are easily administered to infants and children, in food, a single daily dose being adequate. For adults, adequate intake is obtained with **ONE** *Abidec Capsule Daily.*

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63

LIL-LETS

the new vaginal tampon without applicator

A tampon which has been successfully marketed on the Continent during the last five years has now become widely accepted in this country under the name LIL-LETS.

Following extensive clinical trials, LIL-LETS have won the support of leading gynæcological opinion. Samples will be sent to medical practitioners on request.

LIL-LETS have these main advantages:

LIL-LETS need no applicator. By inserting the tampon with the fingers, the risk of bruising is eliminated.

LIL-LETS assist personal hygiene. At 1/6 for 10 they are so much cheaper than other leading tampons that women will be encouraged to change them often. They are easily carried about and easily disposed of.

LIL-LETS are highly absorbent. They absorb almost ten times their own weight in moisture and swell sideways, not lengthways. They are, therefore, really safe.

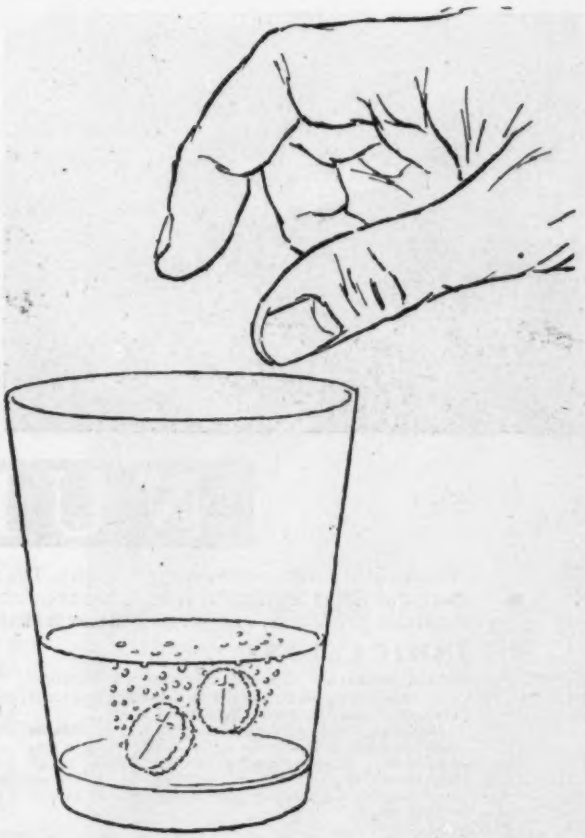
LIL-LETS are individually wrapped. Each tampon is sealed in a transparent cover. There is no risk of soiling or infection when it is carried loose.

LIL-LETS

o.b.

S&N SMITH & NEPHEW LTD · WELWYN GARDEN CITY · HERTS

Now that soluble aspirin is preferred...



IT IS NOW widely agreed that soluble aspirin is to be preferred for general administration both for its solubility and for its neutrality. These qualities ensure rapidity of absorption and a greatly diminished risk of gastric irritation.

"Solprin" meets the need for a soluble aspirin of consistently high quality. Patients find it easier to take than an insoluble tablet, as well as more palatable.

Solprin may now be recommended for all those conditions in which insoluble aspirin was formerly prescribed. Its qualities make it outstandingly valuable whenever heavy or prolonged dosage is called for.

SOLPRIN REGD.

Soluble and substantially neutral

Not advertised to the public

Solprin is available only on prescription and only in Great Britain and Northern Ireland. Clinical samples and literature will be supplied on request.

N.H.S. BASIC PRICE 12/6 for 500 tablets in foil.

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The key to successful peptic ulcer treatment

NULACIN

Nulacin effectively controls gastric acidity. The value of Nulacin in the treatment of peptic ulcer and the prevention of relapse has been confirmed by clinical studies in Great Britain, Australia, the U.S.A. and India. Nulacin tablets are palatable and convenient.

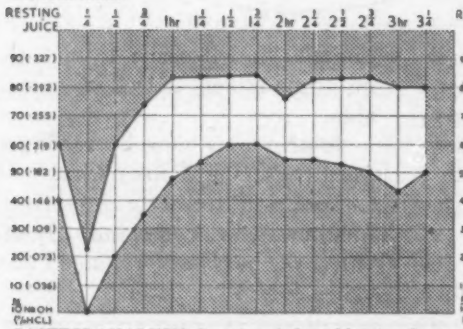
INDICATIONS

Nulacin tablets are indicated whenever neutralization of the gastric contents is required: in active and quiescent peptic ulcer, gastritis, gastric hyperacidity.

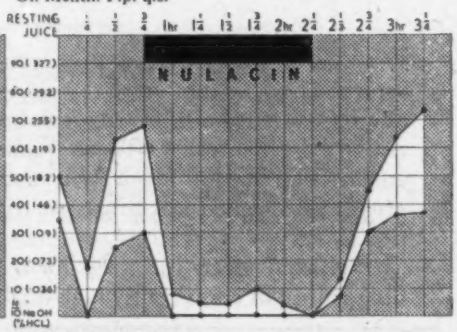
Beginning half an hour after food, a **Nulacin** tablet should be placed in the mouth and allowed to dissolve slowly. During the stage of ulcer activity, up to three tablets an hour may be required. For follow-up treatment, the suggested dosage is one or two tablets between meals.

Nulacin tablets are not advertised to the public, have no B.P. equivalent and may be prescribed on E.C.10. The dispensing pack of 25 tablets is free of Purchase Tax. (Price to pharmacists is 2/-.) Also available in tubes of 12.

Nulacin tablets are prepared from whole milk combined with dextrins and maltose, and incorporate Magnesium Trisilicate 3.5 grs.; Magnesium Oxide 2.0 grs.; Calcium Carbonate 2.0 grs.; Magnesium Carbonate 0.5 grs.; Ol. Menth. Pip. q.s.



GASTRIC ANALYSIS *Superimposed gruel fractional test-meal curves of five cases of duodenal ulcer.*



GASTRIC ANALYSIS *Same patients as in Fig. 1, two days later, showing the striking neutralizing effect of sucking Nulacin tablets (3 an hour). Note the return of acidity when Nulacin is discontinued.*

BIBLIOGRAPHY

The Control of Gastric Acidity. *Brit. Med. J.* 26th July 1952 2 180-182
Medical Treatment of Peptic Ulcer. *Med. Press* 27th February 1952 227 195-199
Notes on Remedial Agents. *Med. Rev.* September 1952 46 162
Discussion on Peptic Ulceration. *Proc. Roy. Soc. Med.* May 1953 46 354
The Effect on Gastric Acidity of "Nulacin" Tablets. *Med. J. Aust.* 28th November 1953 2 823-824
Control of Gastric Acidity by a New Way of Antacid Administration. *J. Lab. Clin. Med.* 1953 42 955
Further Studies on the Reduction of Gastric Acidity *Brit. Med. J.* 23rd January 1954 1 183-184
Clinical Investigation into the Action of Antacids. *The Practitioner* July 1954 173 46
Management of Peptic Ulceration in General Practice. *Med. World* December 1954 81 591-601
Ambulatory Continuous Drip Method in the treatment of Peptic Ulcer. *Amer. Jour. Dig. Dis.* March 1955 22 67-71.

Nulacin is available throughout the British Commonwealth, in the U.S.A., and many other countries. It is known as **Nulactin** in Canada and Sweden.

HORLICKS LIMITED
Pharmaceutical Division
Slough, Bucks.

TIME AND IRON

DEFICIENCY ANAEMIA

THIS WOMAN is six months pregnant; her haemoglobin concentration is low. It is important that she should not be anaemic at term, yet time is not on her side. There may be a delay of up to four weeks before any response is shown to oral iron therapy; and progress thereafter may not be rapid enough to secure a normal haemoglobin value in the time that remains.

A CLEAR CASE FOR 'IMFERON', new iron preparation for intramuscular injection. 'Imferon' can be relied upon to restore the haemoglobin concentration to normal levels in from 4 to 7 weeks.

FULLY DESCRIPTIVE LITERATURE is available and a Technical Information Service is always at your disposal.

A clear case for **IMFERON** IRON-DEXTRAN COMPLEX TRADE MARK

A PRODUCT OF BENGER RESEARCH

BENGER LABORATORIES LIMITED · HOLMES CHAPEL · CHESHIRE

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DISCRIMINATE use of nasal decongestants for the symptomatic relief of catarrhal conditions of the upper respiratory tract is now firmly established in modern therapy. The choice of preparation is important—the aim being to combine maximal efficiency with safety. FENOX has been formulated to meet the basic requirements of the ideal nasal decongestant.

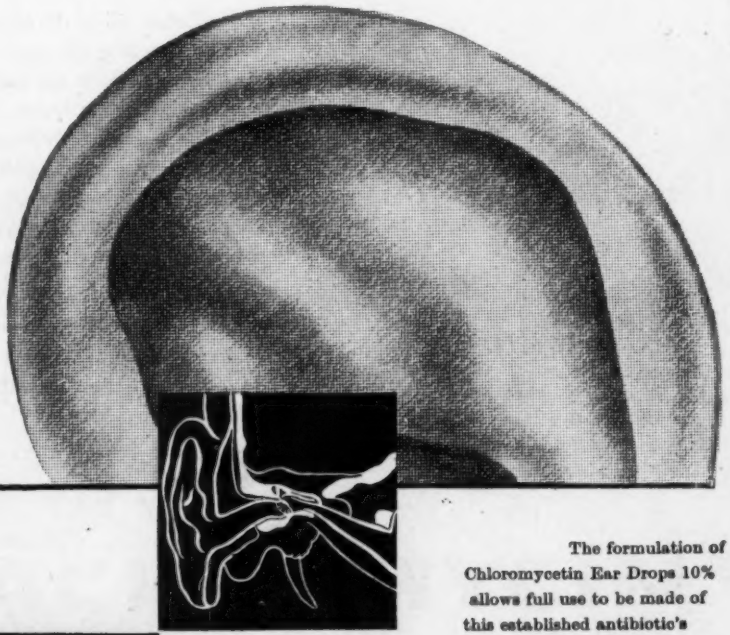
Basic N.H.S. Price ½ fl. oz. Dropper Bottle 1/8d.

FORMULA: *Phenylephrin Hydrochlor.* 0.25%
Naphazolin. nit. 0.025% *Chlorbutol* 0.5%

FENOX
NASAL DROPS

Patients' directions pads and detailed literature on request

BOOTS PURE DRUG COMPANY LIMITED NOTTINGHAM, ENGLAND



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ear drops 10%

in the treatment of
EAR INFECTIONS

The formulation of Chloromycetin Ear Drops 10% allows full use to be made of this established antibiotic's remarkably wide range of bactericidal activity. Chloromycetin Ear Drops 10% are advocated in the treatment of chronic otorrhœa, suppurative otitis media and infections of fenestration and mastoid operation cavities.

REFERENCES:

"Treatment of Chronic Otorrhœa and Chloromycetin"
Brit. Med. J., 2:939, 1951

"Local Application of Chloramphenicol"
Lancet, 2:268, 1951

CHLOROMYCETIN EAR DROPS 10%
(chloramphenicol B.P. 10% in propylene glycol)
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For

the patient

with angina

Peritrate is a valuable aid in the treatment of angina by virtue of its action as a coronary vasodilator. Each 10 mg. tablet begins to act half-an-hour after ingestion and the action continues 4-5 hours. Peritrate prevents anginal attacks, or reduces their frequency, severity and duration. It diminishes the patient's nitroglycerin requirements, and improves exercise tolerance. Peritrate is non-toxic and causes very few side-effects even on prolonged administration.

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Peritrate is now available with Phenobarbitone for the Angina Pectoris patient who needs sedation. Each tablet contains 10 mg. Peritrate and 15 mg. Phenobarbitone.

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AND PERITRATE WITH PHENOBARBITONE

Dosage: *One or two 10 mg. tablets four times a day.*

Packs: *Bottles of 50 and 500. Bottles of 500 tablets are supplied to chemists at 9/- not subject to P.T. Peritrate with Phenobarbitone is supplied at the same price as Peritrate, plus 2/3 P.T.*

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Here are three new presentations of ACHROMYCIN enabling you to choose precisely the preparation best suited to the patient's needs. The growing popularity of this outstanding antibiotic is due to several merits—not the least of which are its unsurpassed antibacterial range and its remarkable freedom from side effects. Today there is a form of ACHROMYCIN to meet every prescription requirement.

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- **ACHROMYCIN Syrup, 125 mg./5 cc. Ideally suitable for children, convalescents and others unwilling or unable to take ACHROMYCIN in capsule or tablet form. Bottle of 2 fl. oz.**

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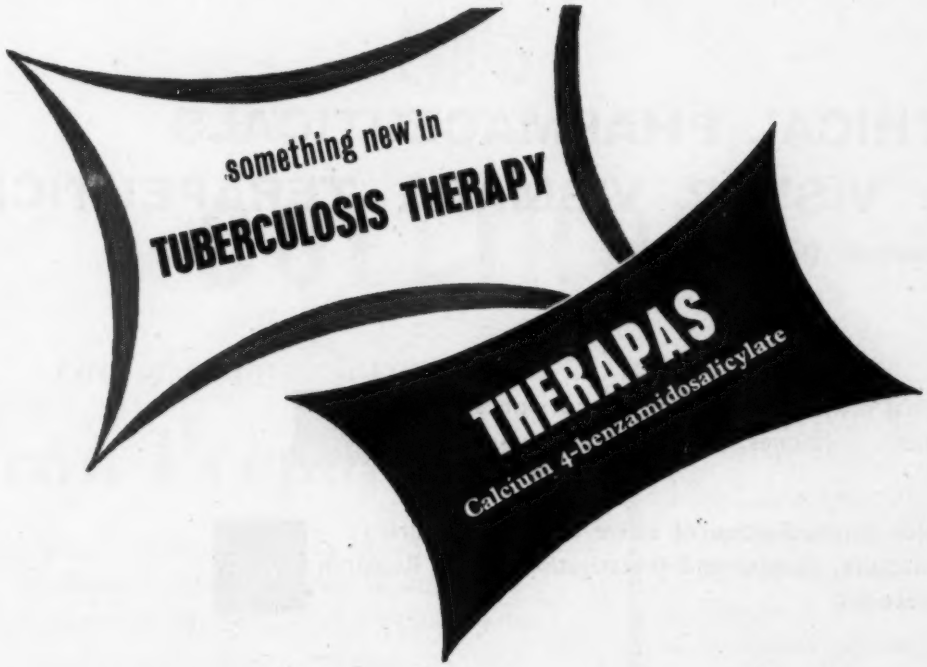

THERAPAS is a modified form of P.A.S. that is more than an alternative.

P.A.S. was originally combined with isoniazid or streptomycin in order to delay the emergence of resistant strains of *M. tuberculosis*. **Therapas does this, too.** It is as effective as P.A.S. for this purpose. Similar in structure to P.A.S., it is converted to it in the body (1). P.A.S. combined with isoniazid or streptomycin is effective against *M. tuberculosis*. **Therapas is more so.** It does not merely act as a foil, but is reported to give satisfactory clinical and radiological results in pulmonary tuberculosis even when given alone (2). In combined therapy it is highly effective (3).

P.A.S., unfortunately, is poorly tolerated. Many patients would welcome an alternative. **Therapas is not so.** It has a slightly sweet, not unpleasant taste. Patients who dislike P.A.S. might well be tried on **Therapas.**

1 *J. Pharmacy & Pharmacol.*, 1953, 5, 849
2 *Schweiz. med. Wschr.*, 1955, 85, 222
3 *Tubercle* 1955, 36, 209

dosage | **Therapas** may be administered in daily doses of 14 G.

availability | Individual packets of 3.5 G. in boxes of 100 packets.
1.0 G. cachets in containers of 100 and 500.
Bulk Powder in containers of 100 G. and 500 G.

S&N *Further information and prices from* SMITH & NEPHEW LIMITED, WELWYN GARDEN CITY, HERTS.

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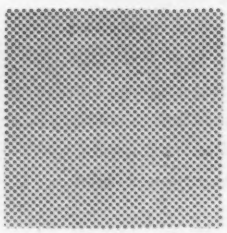
an entirely new preparation for the control of bleeding in medical and surgical conditions



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Many oral iron preparations cause gastro-intestinal irritation thereby making it impossible to administer sufficient iron by the oral route to restore the hæmoglobin level to normal. Colloidal ferric hydroxide in the form of COLLIRON overcomes this great disadvantage, as the iron is presented in a non-irritant form and is readily tolerated even in large dosage over a prolonged period.

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3. *Efficient utilization*
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Bottles of 4 fl. oz. and 8 fl. oz.
Dropper bottles of 30 ml.
COLLIRON is also available in capsules
If rapid response to iron therapy is needed
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COLLIRON

Further information on request from : **EVANS MEDICAL SUPPLIES LIMITED,**
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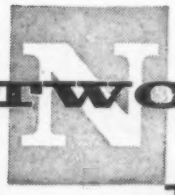
BARBITURATE AND MORPHINE ANTAGONISTS



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MEGIMIDE
β-ethyl-β-methylglutarimide

and

DAPTAZOLE
2:4-Diamino-5-phenylthiazole hydrochloride

in Barbiturate Poisoning

"MEGIMIDE" is "a barbiturate antagonist of real clinical worth. To omit to use it in the treatment of barbiturate poisoning is to run the risk of the broncho-pneumonia that is so often fatal in these cases." (See *Lancet*, 1955, *i*, 181)
"DAPTAZOLE," itself a weak barbiturate antagonist, enhances the action of "Megimide."
"Megimide" and "Daptazole" administered together intravenously ensure safe, quick recovery from barbiturate intoxication without the risk of convulsions and secondary depression which often follow the use of other central analeptics.

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"Daptazole" relieves respiratory depression by increasing the depth of respiration, while in some cases the vomiting and, in most cases, the constipation associated with morphine are also relieved.

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"MEGIMIDE" is of value to lighten or terminate the anaesthesia of patients under the influence of barbituric anaesthetics.

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the completely new oral penicillin in capsule form

Stable in presence of gastric acid
FULLY EFFECTIVE ORALLY

Higher and more prolonged blood levels than with any other oral penicillin

HIGH DOSAGE UNNECESSARY

Comparable with parenteral penicillin

AVERAGE ADULT DOSE : 1 capsule THREE times daily before meals

'PULVULES' PENICILLIN V, LILLY each containing 125 mg. (200,000 units) supplied in bottles of 12 and 100

Lilly
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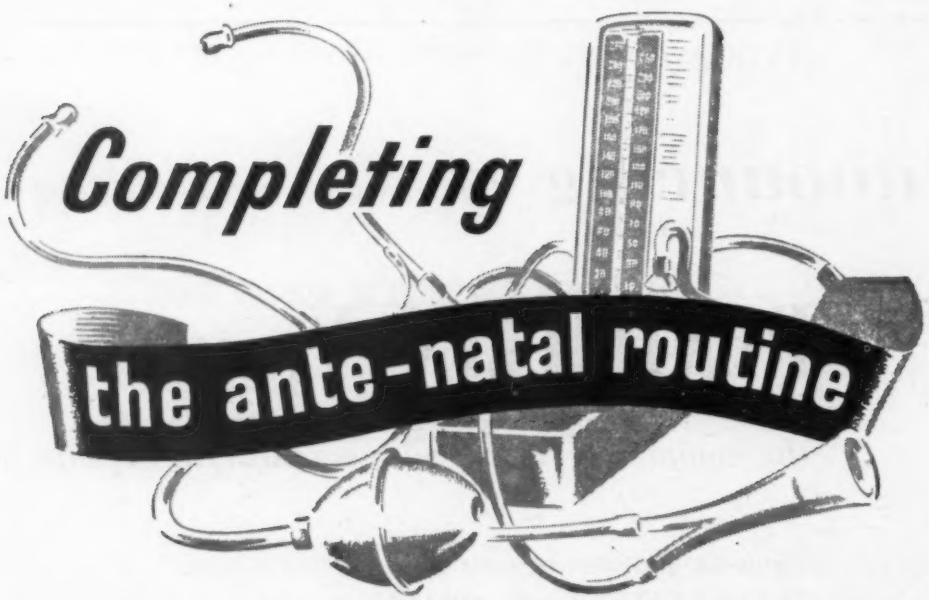
ELI LILLY & COMPANY LIMITED - BASINGSTOKE - ENGLAND



Of the various measures directed towards ante-natal care, none is more vital than a well-planned dietary supplementation. Such routine however need be no arduous matter to the mother. Prenatal Capsules *Lederle* avoid the need for any further supplements by combining many nutritional factors in a single preparation.

The simple routine of two Prenatal Capsules daily is a wise procedure from the time that pregnancy is confirmed. It can advantageously be continued throughout the period of lactation. This ensures a balanced intake of vitamins, bone-forming minerals and haematinic factors sufficient to meet the nutritional requirements of both mother and child.

Prenatal *capsules*

Each capsule contains : Vitamin A, 2,000 I.U. ; Vitamin D, 400 I.U. ; Thiamine Hydrochloride (B_1), 2 mg. ; Riboflavine (B_2), 2 mg. ; Ascorbic Acid (C), 35 mg. ; Nicotinamide, 7 mg. ; FOLVITE* Folic Acid, 1 mg. ; Calcium (in $CaHPO_4$), 250 mg. ; Phosphorus (in $CaHPO_4$), 190 mg. ; Dicalcium Phosphate Anhydrous ($CaHPO_4$), 869 mg. ; Iron (In $FeSO_4$), 6 mg. ; Ferrous Sulphate Exsiccated, 20 mg. ; Manganese (in $MnSO_4$), 0.12 mg. ; Vitamin B_{12}, 1 microgram ; Vitamin K (Menadione), 0.5 mg.

Bottles of 100 and 1,000. **Regd. Trade Mark.*

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Children like it... worms don't

One week's treatment with 'Antepar' Elixir is usually sufficient to eradicate *threadworms*. A single dose clears *roundworms* from the gut. Effective without fasting, purging or supporting measures, 'Antepar' acts by paralysing the worms—they are then expelled by normal peristalsis.

'Antepar', the original elixir of piperazine, is well tolerated by patients of all ages. Its pleasant taste is popular with children. Containing piperazine citrate equivalent to 500 mgm. of piperazine in each fluid drachm, 'Antepar' is supplied in bottles of 4 fl. oz. and 20 fl. oz.

'ANTEPAR' ELIXIR

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Associated Houses: AUCKLAND BOMBAY BUENOS AIRES CAIRO CAPE TOWN DUBLIN KARACHI MONTREAL NEW YORK RIO DE JANEIRO SYDNEY

"...the least toxic of all the iron preparations"

MED. PRESS, 1954 (FEB. 3), P. 112

Clinical trials have shown that Anorvit, the new B.D.H. preparation of iron with vitamins C and K, provides most effective absorption of iron with remarkable freedom from gastro-intestinal disturbance.

'ANORVIT' tablets

TRADE MARK

Containing ferrous sulphate, exsiccated, 3 grains (200 mg. approx.), ascorbic acid 10 mg. and acetomenaphthone 2 mg.

DOSAGE

CHILDREN: 1 tablet 2 or 3 times a day
ADULTS: 2 tablets 3 times a day

Basic N.H.S. prices:
Bottles of 50 tablets 1/10 and 500 tablets 9/6

Detailed literature and specimen packings are available on request.

MEDICAL DEPARTMENT
THE BRITISH DRUG HOUSES LTD. LONDON N.1

ANVT/E/541

INFECTION ACQUIRED IN HOSPITAL *

LEONARD COLEBROOK
M.B. Lond., F.R.C.O.G., F.R.C.S., F.R.S.
LATE DIRECTOR OF THE MEDICAL RESEARCH COUNCIL BURNS UNIT, BIRMINGHAM ACCIDENT HOSPITAL

WE are so accustomed to think of the conquest over infectious disease during the past 100 years as a wonderful triumph (as indeed it is) that we are apt to forget that that triumph has all too often been tinged with tragedy. Our hospitals—the workshops which have enabled us to achieve the triumph—have also, unfortunately, been the places in which grievous harm has frequently been done to a great many people. Patients admitted for one complaint—often one that was not a threat to life, perhaps a cleft palate, a hernia, or a pregnancy—have contracted some infectious disease, and quite often have died of it. That is my rather melancholy theme.

All my working life, as a bacteriologist looking at medicine from the sidelines, this problem has been forced upon my attention. First, in a general hospital, where I saw the not-so-exceptional clean surgical case "go wrong" and develop acute local sepsis or even septicæmia; next, in the first world war, when few open wounds escaped infection after admission to hospital, and one could hardly doubt that much of it had been transmitted there. Later, when bacteriology came to our aid in the investigation of puerperal fever, we got clear proof that streptococcal infection was very frequently being transmitted from patient to patient in maternity institutions; and, finally, during World War II when it was established, in Glasgow and at the Birmingham Accident Hospital, that almost all the sepsis of burns in hospital was due to transferred infection.

Now that my active work is finished it may perhaps be useful to take stock of the present situation and a glance at the past; to summarise the lessons we have learned in recent years; and to put forward a few suggestions.

There are two reasons why it seems opportune to do this at the present time. First, now that post-war difficulties are receding a little, many people are thinking about the need for new hospitals, and it is to be hoped that, in the planning of these hospitals, mistakes which have contributed to the spread of infections in the past will not be repeated.

Secondly, we have come to rely very much in recent years upon antibiotics for our defence against infectious diseases, and there are some indications that that defence is, to some extent, breaking down. Thus, in his valuable discussion of resistance to antibiotics Lowbury (1955) stated that: "The dilemma of hospital infection has been complicated rather than solved by chemotherapy." And others have voiced the same opinion. If that situation is not resolved—and there are at present no signs that it will be—hospital infection may become much more important to us in the future than it has been in the past few years.

Such a change has indeed already been reported from one large general hospital, in Sydney. A systematic check on the streptococcal infections developing *after admission* to the surgical wards during the past five years has shown a steady rise—from four in 1950–51 to twenty-eight in 1952–53 (Rountree 1955). And this rise coincided with a rise in the incidence of wound infections by penicillin-resistant staphylococci. Dr. Rountree's comment on this association was as follows:

"When, however, the streptococcus is implanted into a surgical wound along with an antibiotic-resistant staphylococcus that is a potent penicillinase producer, it would seem that parenteral penicillin cannot be relied upon to prevent streptococcal colonisation of the wound."

It would be of great interest to know whether a rising incidence of infections by *Streptococcus pyogenes*, similar to that observed in Sydney, has been found in other hospitals.

Survey of Hospital Infections

My survey of hospital infections will be limited to the last 100 years, and for the most part to the last 40 years—that is, to the period in which bacteriological investigations have thrown so much light on the interpretation of clinical data.

MATERNITY HOSPITALS

The decade 1850–60 was perhaps the blackest period in all the story of hospital infection, for it was then that Semmelweis (1861) revealed to the medical world the sinister fact that in some of the wards of the great maternity clinic of Vienna—the largest in the world at that time—more than 10% of the mothers were dying of puerperal fever. It seemed clear that in many cases infective material was being conveyed on the hands of accoucheurs from the post-mortem room to the lying-in wards. The adoption of an antiseptic ritual brought the mortality down to about 3%.

The Vienna hospital was not alone in this experience. Epidemics were frequent in the maternity hospitals of England and America, although not quite on the Vienna scale. At York Road Lying-In Hospital in London the average mortality over about 30 years prior to 1875 was 4% (Cullingworth 1888).

The menace of puerperal fever in hospitals diminished gradually with better understanding of the part played by streptococci from the throat and nose; with the adoption of asepsis and antisepsis; with the development of better obstetric techniques and the better organisation of the maternity services. Finally there was a spectacular fall in the death-rate after the introduction of 'Prontosil' and the sulphonamide drugs in 1936 (Colebrook and Kenny 1936).

It is important to recognise that, although the risk of epidemic sepsis is now much less than it was 30 years ago, it is still a factor to be reckoned with. At Queen Charlotte's Hospital, after a year without a single case of streptococcal infection, there was a troublesome little epidemic in 1952 involving 25 mothers (Gibson and Calman 1953). Happily there were no deaths. The source of the infections was not discovered. Evidently the threat of puerperal infection must be borne in mind by all those planning future maternity hospitals, and continuous vigilance is still required on the part of all those engaged in obstetric work.

NURSERIES OF MATERNITY HOSPITALS; AND OTHER INSTITUTIONS IN WHICH INFANTS ARE CARED FOR

It is difficult to assess the amount of cross-infection in the nurseries of maternity hospitals. The records of non-fatal infections are seldom included in the annual reports, and in the records of fatal cases there are often complicating factors, such as immaturity or birth injury, which make it difficult to decide how far infection was responsible for the deaths. It is, however, common knowledge that within the last 20 years neonatal staphylococcal infections have been a cause of grave concern in many maternity hospitals; and a number of reports of more serious epidemic illness have also appeared.

Three outbreaks in English cities far apart were reported in 1941 by Ormiston. Among 996 infants at risk 139 became infected and 41 died (case-mortality 29%). The infective agent was not detected. Another English epidemic involving 18 infants, of whom 15 died, was reported by Sakula in 1943. Wallace (1947) stated that 25% of all neonatal deaths among premature babies in the maternity department of the

* Based on a lecture given at the University of Otago, March, 1955.

Edinburgh Royal Infirmary were due to infection which he considered avoidable "to a great extent."

In Australia salmonella epidemics have been reported by Rubbo (1948) from Melbourne and by Mackerras and Mackerras (1949) from Brisbane. The one in Melbourne involved 37 infants infected in hospital, and there were 10 deaths. The one in Brisbane involved 11 babies of whom 4 died.

In the U.S.A. a series of 27 outbreaks in 19 different hospitals was reported by Best in 1938. Among 5082 babies at risk 750 became infected (by an unknown agent) and 356 died (case-mortality 47·5%). And in another American epidemic, described by Barenberg et al. (1936), 32 babies were infected, of whom 14 died.

In other institutions to which infants are admitted—e.g., foundling hospitals and hospitals for sick children—such high mortality-rates have been reported that there can be little doubt that transmission of infection was a major factor; and in some instances the origin of the infection within the institution was definitely established.

Thus, Chapin (1915) referred to mortalities ranging from 18 to 57% in institutions receiving infants in New York State, while the mortality for comparable age-groups outside such institutions was only 12%. Sauer (1935) reported that out of 942 infants cared for in the Evanston "Cradle" during its first 6 years 40 died of enteritis contracted within the institution.

In 1948 Brehme summarised a number of outbreaks in nurseries in England, the U.S.A., and Germany in which the case-mortalities had ranged from 10 to 40%. (No data about these outbreaks were given.)

In 1954 Jameson et al. reported a series of outbreaks of gastro-enteritis among infants admitted to an English children's hospital in the course of 6 years. 118 children were sick and 43 died. In this, as in many other epidemics of gastro-enteritis reported in Great Britain, in Scandinavia, in Germany, and in the U.S.A., it was suspected that a strain of *Escherichia coli* was the responsible agent.

When it is borne in mind, as Robert Cruickshank (1944) has reminded us, that these published reports are comparable only to the visible part of an iceberg, much more remaining undisclosed, it would seem that we have still much to learn about the menace of cross-infection to infants in institutions. The careful work of Rogers (1951) has emphasised the great difficulty of preventing such infections even in one of our newest hospitals, with good facilities for bacteriological investigation.

It is to be hoped that in the future many more maternity hospitals will publish every year a pædiatric as well as an obstetric report (as suggested by Thomson (1952)); and that other institutions admitting infants will reveal how far epidemic disease has contributed to their sickness and mortality rates from year to year.

CHILDREN'S WARDS IN GENERAL HOSPITALS

The careful study of Joyce Wright (1940) at University College Hospital showed that of the 551 patients in the children's wards during a 12-month period no less than 13·1% acquired manifest or latent infection by hæmolytic streptococci. The manifest infections included wound suppurations, sore throats, pyrexia, and otitis media. In addition to these there occurred during the same period two outbreaks of diphtheria (15 patients), two of *sonnei* dysentery (10 patients and 1 nurse), one of catarrhal jaundice (1 patient and 3 nurses), 6 cases of intercurrent gastro-enteritis of infancy, and 1 case of measles. In all, at least 104 (18·9%) of the patients developed intercurrent infections, manifest or latent, during their stay in hospital.

Another study, which was based chiefly on clinical findings and took account only of manifest infection, was that of Watkins and Lewis-Faning (1949) carried out in 14 English hospitals. They found that of 10,000 children at risk during a 12-month period about 7% developed signs of cross-infection. Treatment for those infections caused the children to occupy hospital beds for 12 days on the average longer than they would otherwise have done. In 41 children death occurred which was judged to be partly or wholly due to the acquired infection. Infections of the upper respiratory tract took first place in all these hospital infections, and those of the gastro-intestinal tract second. The writers were unable to come to any conclusion as to the most effective means of controlling them.

CHILDREN IN HOSPITALS FOR INFECTIOUS DISEASES

The difficulty of preventing the spread of chickenpox and measles, in spite of isolation and barrier nursing, is too well known to need emphasis. Diphtheria, too, has often been implanted on scarlet fever—and vice versa—often with fatal results. And the menace of hæmolytic streptococcus infections in measles patients is notorious. Among 43 such patients Allison (1938) found that cross-infection by streptococci occurred in 22. In another paper he reported that the incidence of otitis media in hospital wards was sometimes as high as 20%, and among the children with this complication about one-third developed mastoiditis—and often permanent deafness.

CROSS-INFECTION IN SURGICAL WARDS AND THEATRES

I need not remind you of the grim story of clean surgery in the 'eighties and 'nineties of last century, before the advent of asepsis and antisepsis and the gradual evolution of the modern (apparently) dust-free operating-theatre. Lord Moynihan used to tell how when he was a house-surgeon in 1888 two out of three patients used to die after opening the peritoneum. In the light of modern knowledge we cannot doubt that most of those deaths were due to infection conveyed in the theatre. Brewer, writing in 1915, has told us that when he joined the staff of the Roosevelt Hospital in New York in 1895 nearly 40% of clean operations were followed by septic infection.

Happily, all that has vastly changed and today the incidence of postoperative sepsis is trifling compared with the immense amount of clean surgery successfully performed without such misfortunes. And, thanks to the antibiotics, such infection as does occur seldom has very serious consequences.

But my own experience in British hospitals compels me to think that there is still much more infection transmitted in our operating-theatres and wards than we should accept. We have not nearly reached the irreducible minimum that every conscientious surgeon would wish for. In the course of 40 years I have worked in fairly close coöperation with surgeons of the first rank in two general hospitals, a plastic-surgery unit, and finally at the Birmingham Accident Hospital. In all these institutions cross-infection in the wards and theatres was a by no means uncommon event. I cannot quote actual figures because no systematic investigations were made. From talk with fellow bacteriologists and with surgeons from other hospitals I gather that my experience has not been at all unusual. In the case of the Birmingham Accident Hospital some of these misadventures have been published. Thus, Sevitt (1949, 1953) recorded 2 fatal cases of postoperative tetanus and 1 (non-fatal but requiring amputation) of gas-gangrene; and the acquired infections (by *Strep. pyogenes*) occurring in the Burns Unit are set out in the report by Colebrook, Duncan, and Ross (1948). There were certainly others which were not published. Inquiry into the theatre infections made it seem probable that one factor contributing to them was a faulty ventilation system which sucked contaminated dust into the theatres from a corridor and lift shaft and carried it up past the operating-table to a fan high up on one of the walls.† That is the plan unfortunately adopted in many—I suspect most—operating-

† It is hoped to replace these old and faulty theatres in the near future by others having positive pressure ventilation (with filtered air) and designed with the special object of avoiding all lodgment of dust on walls, lamps, furniture, &c.

theatres in this and other countries. I shall return to this matter later.

In America an investigation by Ives and Hirschfeld (1938) indicated that in Newhaven about 5% of clean wounds developed some signs of infection, and a review of the literature suggested to these authors that other hospitals had a similar rate. Hunt (1933) thought that "ten per cent. expresses very conservatively the morbidity from operative wound infection under average standards of technique and equipment" at that time. Fortunately the majority of the infections were mild. He foresaw the evolution of an operating-theatre designed to give much more strictly aseptic conditions than those available in most hospitals. Meleney (1935) wrote strongly in the same vein. He told us that on one occasion, when a clean wound became infected at the Presbyterian Hospital, New York, the surgical staff met to discuss it. One of the chiefs was asked what he thought the infection-rate was on his service. He guessed it was about 2%. Dr. Meleney in turn thought it might be nearer 5%. To settle the matter a careful analysis of the records was put in hand—and the true figure turned out to be 15%. Meleney's comment on this was as follows:

"I am sure that impressions are woefully inaccurate in most instances, and when you hear anyone say that the wound infections in his hospital are negligible the statement should be discounted, unless there is an actual count and a careful study of the dressing notes."

That was written 20 years ago—but is the situation very different today? I doubt it. There are few data on which to base an opinion. Strahan reported in 1951 that 4·3% of 370 operations on inguinal hernias (by grafting) were followed by frank sepsis. I have found no other post-war figures for clean surgery.‡ It may be that the infection-rate is actually much less than before the war, or that many incipient infections are headed off by the practice of operating under an "antibiotic cover." I suggest that it would be a salutary thing if one or two of our larger hospitals were to carry out a combined clinical and bacteriological follow-up of all their clean surgical cases for a period of, say, a year. That would tell us the true position in those hospitals and would give other hospitals a valuable yardstick by which to compare their own results from year to year. It might also bring to light some of the sources of these troublesome cross-infections.

In the special field of plastic surgery, where such brilliant results have been achieved (largely due to the pioneer work of the men who came to us from New Zealand, Sir Harold Gillies, Sir Archibald McIndoe, Rainsford Mowlem, and John Barron) transmission of infection within the wards and theatres has always been, and I fear still is, a very serious menace. It will be recalled that during the late war Francis (1942) described an epidemic of streptococcal infection in one of our best plastic-surgery units. In another Spooner (1941) found that about 25% of all the cases admitted acquired a streptococcal infection during their stay in hospital; and about 65% of all patients were thus infected. (It must be admitted that war-time conditions, deficient ventilation, &c., may have played a part in these results.) There is no doubt that if we could win greater control over this menace of hospital infection it would enormously increase the scope of the plastic surgeon's art.

In another department of surgical work—that which deals with the ear, nose, and throat—the conditions have of course always been exceptionally favourable to hospital infection, since so many patients are already infected on admission. I need only remind you of the careful investigations of Okell and Elliott during the years 1933–36, which revealed that there had been no less than fourteen outbreaks of cross-infection in the ear, nose, and throat wards of University College Hospital, London. 52 patients were involved in these outbreaks, and 1 of them died. In their report there is also a reference to the deaths of 3 young men before this period who had died from postoperative sepsis following tonsillectomy, and the authors considered it probable (although not certain) that their infection had been acquired in the hospital.

Finally, in connection with burns, hospital infection is of quite special importance. Almost all extensive deep burns become more or less infected (unless they can be grafted within a day or two of the accident), and it has been clearly established by work at the Birmingham Accident Hospital and elsewhere that that infection is nearly always a hospital infection.

The suffering attributable directly to these infections (*an uninfected burn is usually painless*) is often very severe. In many cases they lead to death. The other consequences—loss of morale, slow healing and contractures, loss of function—all too often add up to a grievous load of misery for the burned patient. The average stay in hospital for the more severe cases is between 40 and 50 days, which represents a formidable expenditure of hospital beds, as well as of surgical and nursing personnel. That is a situation which we should no longer accept, for it is clear that a large part of the infection could be prevented. But we cannot prevent it with our present set-up for the treatment of these injuries. I have suggested elsewhere how it might be done if we dealt with them in specially equipped centres (Colebrook 1950).

CROSS-INFECTION IN ADULT MEDICAL WARDS

During the late war I was told by one of our leading physicians that any patient admitted to the medical wards of his hospital (one of the most famous in Great Britain) had a 50/50 chance of acquiring an infection of the respiratory or the urinary tract. I hope that was an over-statement, and that the infections he had seen were partly the result of war conditions. I cannot recall any inquiry into the infection hazards in peace-time, but it would not be surprising if they are considerable.

That brings me to the end of my survey. I have given you only a small part of the evidence that would be forthcoming if one were to make an exhaustive study of the literature, or, better still, if one had access to the very many unpublished records (for it is the exception rather than the rule to make public our misfortunes of this kind). But I have perhaps said enough to justify my belief that infection transmitted within our hospitals is still a serious problem, calling for much more investigation and for well-directed preventive measures.

I have said nothing about tuberculous infections because it is more difficult to trace the origin of tuberculosis in individual cases. And I have said nothing about virus diseases and tropical diseases because I have no first-hand knowledge of them.

Lessons Learned in Recent Years

I would like now to remind you briefly of some of the circumstances which contribute to these misfortunes; and, finally, to consider with you what steps we could take to eliminate them.

It has been clearly established, by bacteriological detective work, that many infections, both in and out of hospitals, owe their origin to organisms expelled from the throat or nose of patients suffering from some infective condition of the upper respiratory tract: and our hospitals are full of such patients. The organisms so

‡ Since this was written my attention has been called to Howe's report (*New Engl. J. Med.* 1954, **251**, 411) that there was evidence of major or minor septic infection following 7·2% of clean operations performed in a hospital in Massachusetts. And more recently Blowers et al. (*Lancet*, Oct. 15, 1955, p. 786) have reported a steady increase of infections, to 10·9%, among 138 patients operated on in a thoracic-surgery unit in the north of England.

expelled, by coughing or sneezing or even talking, can survive in dust, and retain their capacity to infect for many weeks § (White 1936), and they may be carried in the form of minute droplets to long distances. This, of course, is an old story, but it is one that we can ill afford to forget in considering hospital infections. In particular we do well to recall the important work of Hamburger and Green (1946), which demonstrated the very large number of organisms expelled on to handkerchiefs, hands, bedding, and clothing by patients with infection of the nasal sinuses. That would seem to call for very special precautions in the hospital treatment of such cases—precautions which, I fear, are seldom taken.

The increasing number of hospital inmates, both patients and staff, who are harbouring staphylococci resistant to antibiotics in their noses, without manifest signs of infection, offers another difficult problem, for there is little doubt that these nose carriers bear an important relation to the rising tide of staphylococcal cross-infection of wounds.

The study of wound infections has also been fruitful in recent years. Thanks to the development by Bourdillon (Bourdillon et al. 1941) of methods of detecting and counting organisms in air, we have learned that every time we disturb the dressings on a wound in the open ward—as they are disturbed in almost every hospital in the world—there occurs a scatter of thousands of subvisible particles into the surrounding air; and all too often these particles carry pathogenic bacteria which may be transported by air currents to colonise another patient's wound (Bourdillon and Colebrook 1946). The number of wounds infected in this way in every hospital must be very large.

We have learned too that the covering of an open wound by the conventional sterile dressing may afford less protection than we have supposed. If the dressing becomes soaked with exudate many pathogens, derived from the air or bedding or hands, can grow through the mass of serous fluid and quickly colonise the wound beneath (Colebrook and Hood 1948).

Reverting to the scatter of organisms by the disturbance of dressings I would remind you that a similar, very large, scatter occurs every day during the ordinary process of bedmaking in the wards. Staphylococci in particular are constantly being disseminated in this way because they are so frequently present in the noses of patients and staff. Blankets are probably the most important reservoirs of harmful organisms because they liberate so much fluff—and also because *they are never sterilised* in most hospitals. I shall have more to say about this later.

Since the bedding is so often contaminated with pathogens it is not surprising that nurses' hands may transmit them. My colleague Dr. Lowbury once found that *Pseudomonas pyocanea* could be grown from 50% of the ward nurses' hands at a time when there were a number of burns infected with that organism.

Intravenous infusions have also frequently been incriminated as carriers of infection; and the unsterile water or saline (sometimes stored in corked bottles) used for rinsing syringes or other instruments that have been kept in antiseptics. In other cases flies, or unsterilised feeding utensils, thermometers, bedpans, toys, or books have been the proven or suspected transmitting agents.

Some Suggestions

I come now to my epilogue. It is clear that there are many channels by which infection can spread in a hospital community. What steps could we take to diminish the chances of such spread?

It has sometimes been suggested that we may be able, at some time in the future, to build up the resistance of patients to all the microbes they are likely to encounter in hospital. That seems to me so very problematical that I shall say no more about it. It is certainly not yet on the horizon.

There are two alternative policies. We can accept the hazards that we have at present in our hospitals, in the belief that it is not practicable to reduce them very much, and put our trust in antibiotics and immunisation and other antibacterial devices to deal with such infections as may come along from time to time. We see signs of that policy in action today in the indiscriminate use of antibiotics. It seems to me a very dangerous policy, for it will surely encourage and condone all sorts of evil practices. And it will almost certainly lead to a very wide dissemination of pathogens which have become resistant to many or all of the antibiotics—a situation which might have extremely serious consequences.

The alternative is to strive continuously to block the many channels by which pathogens are transmitted in our hospitals so that the hazards of cross-infection are progressively diminished—and to keep our antibiotics and immunisation as a second line of defence to be used only when, and if, the front-line defences have failed. That surely must be the right policy—albeit it is the hard way. How then are we to set about the job of diminishing the hazards? Here are a few suggestions and some questions:

1. We should, I think, *make it our aim to diminish the amount of contaminated dust in our wards—and to prevent its dispersal by air currents, so far as possible.*

A large part of the dust in a ward comes from bedding, especially from sheets and blankets. The former are normally sterilised by boiling in the laundry when each patient is discharged, and at frequent intervals while he remains in hospital. It is quite otherwise with the blankets. Because of the risk of shrinkage and felting they are never boiled in most hospital laundries, nor are they washed more often than is strictly necessary.

I have myself cultivated hæmolytic streptococci (by mere swabbing) from blankets just returned from the laundry in a hospital where many burns were being treated (Colebrook et al. 1945). Using a vacuum-cleaner device Lemon (1943) has shown that the blankets used by a scarlet-fever patient may sometimes harbour very large numbers of hæmolytic streptococci. Rountree and Armytage (1946) with a similar technique found that 31 out of 47 blankets from surgical wards gave a culture of these organisms. (Of the 24 from a male ward 19 were positive; and of the 9 samples from the ear, nose, and throat wards 8 were positive.) Hamburger and his colleagues (1946) have also demonstrated the very heavy contamination of bedding used by patients with streptococcal infection in the nose.

Staphylococci are found still more commonly and often in very large numbers. These, and hæmolytic streptococci, can remain viable in the dust disseminated from blankets for many weeks.

During the war, when this potential source of hospital (and barrack) infections was recognised as a problem affecting the health of civilians and of the Armed Forces, considerable progress was made in dealing with it. It was shown by Andrewes and his colleagues in 1940 that the scatter of fluff could be much diminished by the oiling of woollen bedding and bed-clothing with a mineral oil; and later, when stabilisers, such as cetyl pyridinium bromide, were included in the emulsion, it was found that these could also exert a considerable bactericidal effect (Rountree 1946). Trial of this oiling procedure on all the bedding in a measles ward, combined with oiling of the floor, was reported to give a great reduction of the streptococcal content of the air by comparison with that of an untreated control measles ward; and also a great reduction of the cross-infection rate (Wright et al. 1944). In America it was claimed (Puck et al. 1945) that still greater control over cross-infections was

§ One organism which apparently cannot so survive is the common-cold virus.

obtained by combining these dust-suppressive measures with vaporisation into the air of triethylene glycol.

These were important steps forward; but, with the return of peace-time conditions, interest in this problem seems to have lapsed and it is probable that few hospitals have continued to take the menace of infected bedding seriously. In the Burns Unit of the Birmingham Accident Hospital oiling of the blankets has continued and no serious disadvantages have been encountered. Low-temperature sterilisation (5 lb. for 20 minutes) has also been adopted. This has seemed to cause less shrinkage and felting than the usual laundering.

Recently chemical sterilisation, combined with laundering, has been advocated by Blowers and Wallace (1955). They used a solution of cetyl trimethylamine bromide, but it is not yet clear that this is the best antiseptic for the purpose. The authors admit that it is not very effective against *Ps. pyocyanea*; they have not excluded the possiblity that it may cause troublesome sensitisation effects in some patients (as does the nearly related cetrimide); nor have they established that repeated soaking of the blankets will not cause serious shrinkage.

In short, we do not know at present what is the optimal procedure for dealing with hospital bedding, and there would seem to be need for an ad-hoc collaboration of applied bacteriologists and representatives of the laundering and textile industries. Such a joint investigation might yield large dividends in increased control over hospital infections.

2. I feel sure we could greatly *improve our methods of removing dust from the wards.*

In this connection the Nuffield Trust's investigation of the functions and design of hospitals (1955) found:

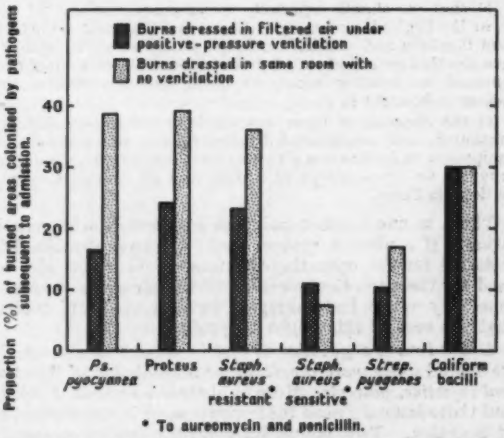
> "Little was done in the wards to suppress dust. In spite of the strong and frequent recommendations of the Medical Research Council and the British Paediatric Association, none of the 24 wards oiled either bedclothes or floors, and the usual way of cleaning was to dry-sweep the floor with a broom 2 or 3 times a day. Floors were scrubbed with soap and water every three months, and polished daily with a 'dummy.' . . . Very few wards had the use of a vacuum cleaner."

I submit that, in view of what has been widely known for the past ten years about the presence and survival of pathogenic organisms in dust, the continuance of these archaic methods in our hospitals indicates that our health authorities have been grievously non-progressive. The advance that has been achieved in our operating-theatres has had no counterpart in the management of the wards, where undoubtedly many of the cross-infections occur. Surely in our present hospitals the broom and dry-sweeping should be completely replaced by vacuum-cleaning. And in our new hospitals could we not provide a built-in suction system (as suggested by Bourdillon et al. (1948)) to which the ward cleaners have only to attach the usual nozzles and flexible tubing?

The treatment of floors by spindle-oil, which was recommended during the war as a means of matting up the dust, has not proved acceptable to most ward-sisters. They dislike the slipperiness of the surface while the oil is drying; it is alleged to do harm to nurses' shoe-leather; and the dull surface is not pleasing to the eye. There seems to be need for some preparation which has none of these disadvantages and will seal the smaller cracks, so discouraging the lodgment of dust, and facilitating its removal.

The disposal of soiled bed-linen also deserves special consideration. I have too often seen it thrown on the floor in the ward or in a corridor, for sorting by the nurses. Surely it should be placed immediately in closed containers, and removed, if possible by a chute, for sorting well away from the hospital building—and by somebody other than a nurse.

3. My third suggestion has to do with *ventilation.* In 1949 *The Lancet* put the matter forcibly in these words:



* To aureomycin and penicillin.

Bacterial flora of burns during a trial of an air-conditioned dressing-room (Lowbury 1954).

> "Hospital authorities," it said, "who insist on clean milk and clean water should be equally particular about the cleanliness of the air in their operating-theatres and casualty dressing-rooms." Is there any hospital in the world where that rule holds?

Or, to put it in another way: How many surgeons have any idea whether the air of their theatre is clean at the beginning of an operation or to what extent it is polluted during an operation on an infected patient? These questions are very rarely asked—and still more rarely answered—by an ad-hoc bacteriological investigation. And yet such an investigation is not difficult, if one employs a Bourdillon air-sampling apparatus—which should be available to the hospitals in every large city.

For the past 10 years in Birmingham we have dressed all our burns in clean air such as the *Lancet* leader called for—that is to say, air with one or less microbe-carrying particle per cubic foot of air. We have obtained that degree of purity by leading into the room a stream of warmed and filtered air sufficient to maintain a slight positive pressure in the room. It is diffused at ceiling level in order to avoid an undesirable draught around the operating-table. Such a downward stream effectively assists gravity by continuously sweeping all particles in the air towards the floor, whence they are sucked out of the room to the outside air by a fan. Within 5, or at most 10, minutes after each patient leaves the room, the air is almost microbe-free, and safe for the next patient.

Dressing our burns in such an atmosphere has paid us handsome dividends. Dr. Lowbury (1954) has published the results of a controlled experiment designed to get statistical evidence of this benefit. He has kindly allowed me to summarise his data in graphic form in the accompanying figure.

It is clear that when *Ps. pyocanea* or proteus or penicillin-resistant staphylococci were the indicator organisms there was a very substantial advantage in dressing in clean air. In the case of streptococcus the advantage shown was rather less, but the total number of wounds so infected was not very large. In the case of coliform bacilli and penicillin-sensitive staphylococci no advantage was demonstrated, perhaps because many of these organisms were derived from the patient himself, and their transfer to the wound occurred independently of its dressing.

The deductions which I think we are entitled to make from all our Birmingham experience are these:

(*a*) that it is possible, and quite practicable, to have much cleaner air in operating-theatres than we have usually had in the past—and at no great expense;

(*b*) that we should especially avoid contamination of the air at the beginning of an operation. For that reason unsterilised blankets and woollen stockings should never be brought into the theatre; and soiled dressings and plasters should be removed in another room whenever possible—before the patient is brought in;

(*c*) the dressing of open wounds in wards should be discontinued. Air-conditioned dressing-rooms, with appropriate equipment to facilitate a strict no-touch technique, should be provided to serve groups of wards, and all dressings should be done in these.

There is one further point in connection with ventilation. If a plenum system such as I have described is installed for the operating-theatres, could it not also be used for the periodical cleaning of the air of the wards—especially while bedmaking is in progress? (I realise that the cost of this might be prohibitive.)

4. My fourth suggestion is that in most of our hospitals we should *make more provision for the isolation of infected, and infective, patients.* More cubicles are needed, I think, and there is surely need for improvement in the technique of isolation. Two points have struck me as especially important. First, cubicles should be so constructed that they can be easily and quickly sealed for fumigation. Second, the ventilation of cubicles should be such as to minimise the chance of infectious agents being carried into corridors or adjacent wards. With a cruciform arrangement of cubicles having a central common servicing department, and outside corridors, it was found by Peters (1943) that cross-infection of infectious fevers was almost entirely eliminated, and the occupation of beds correspondingly diminished.

Mixed up with this question of the technique of isolation and general ward management is the very difficult problem of how to dodge the transmission of pathogens by nurses' hands and clothing. I feel that a solution of this problem is fundamental if we are ever to get rid of infection in severely burned people—and probably also for the care of infectious diseases in children. I suggest, tentatively, that the nurses should make more use of rubber gloves; that there should be more facilities for them to wash their hands; and that the overalls used for bed-making should then be discarded and, if possible, hung in a formalin-disinfecting chamber. The suggestion by Duguid and Wallace (1948) that they should work in boiler-suits instead of the traditional uniform is also worthy of serious consideration.

Other matters of ward routine that need attention, at any rate in most British hospitals, are: the sterilisation of feeding utensils and of bedpans, basins, and baths; the provision of individual thermometers; and the much more active control of flies.

Finally, there are two important items of hospital organisation that are especially germane to this question of infections. The first is the desirability of having in all our larger hospitals a *central sterile supply department* for the issue of syringes, saline solutions, distilled water, dressings, &c. I was much impressed with the value of this feature in some American hospitals so long ago as 1937, but in 1955 the Nuffield Trust reports "There is no example of such a department in the British Isles at the present time." I suggest that the lack of it has been responsible for very many serious, and not a few fatal, infections in the past years.

And last—do we not need, again in the larger hospitals, one individual whose responsibility it is to direct and coördinate all the activities which make for safety from infection? We have had too many chiefs in our hospital communities—medical superintendents, matrons, surgeons, and physicians—all of them concerned with this matter, but it has been no one person's business to find out whether the blankets were being sterilised in the laundry after use by a patient with a streptococcal infection; or whether the sterilisers were functioning properly; or whether the rubber gloves and dressings were being properly packed in the drums; or whether the antiseptic employed for cleaning the theatre floor, and the surgeons' rubber boots, was of sufficient strength; or what steps were taken to sterilise the anæsthetist's equipment; or whether there were throat and nose carriers of streptococci working in the wards; or whether adequate provision was being made to prevent flies breeding in the dustbins.

I would like to see these and a hundred similar matters the business of an *infection control officer* appointed for that job. He would of course be authorised to make an immediate inquiry when any instance of hospital infection came to his notice, and to issue a report upon it so that, if it had resulted from any mistake in procedure, this could be recognised and rectified. And each year he would prepare a factual report upon the hospital's success or otherwise in avoiding cross-infections, and state the case for any reforms he believed to be necessary.

Such an officer should be the spearhead of our attack upon hospital infection. And I believe his appointment might well prove to be an economy, because in exercising his functions he would inevitably exert a check upon the enormously wasteful and very often ineffectual use of disinfectants, antibiotics, and other antibacterial agents which has often occurred in the past; and, by reducing cross-infections, he would correspondingly increase the value of the hospital's service to the community.

There will of course be difficulty at first in finding suitable officers for such appointments, but that, I think, will settle itself when the need for them is recognised—just as happened years ago when the need arose for anæsthetists and radiologists.

It has sometimes been suggested that the functions of such an officer should be performed by a committee, but I fancy that, in Britain at any rate, that would not make for efficiency. The officer must, of course, be required to submit his proposals on major reforms to a committee, but he must also have authority to act on his own in smaller matters.

* * *

Summarising, I would submit that we have still a long way to go before the transmission of infection in hospitals is a thing of the past. In our new hospitals I would like to see:

Rooms provided for the dressing of all open wounds, designed with the specific aim of aiding a strict no-touch technique.

Ventilation plant which will ensure the continuous elimination of bacteria from the air of these rooms and of the operating-theatres.

Adequate isolation for infected patients in cubicles which can be readily sealed for fumigation; and either open corridors for the servicing of these cubicles, or inside corridors from which the air is continuously exhausted.

Chutes for the disposal of soiled bedding and dressings, so that these are never handled by nurses.

More effective provision for the removal of dust from wards, and for the sterilisation of blankets.

More effective measures for the exclusion of flies from wards.

A central sterile supply department for syringes, dressings, sterile water and saline, &c.

An infection control officer; and a systematic check, year by year (in some hospitals at least), on all the infections acquired in hospital. These should be published.

REFERENCES

Allison, V. D. (1938) *Lancet*, i, 1067.
Andrewes, C. H., et al. (1940) *Ibid*, ii, 770.
Barenberg, L. H., Levy, W., Grand, M. J. H. (1936) *J. Amer. med. Ass.* **106**, 1256.
Best, W. H. (1938) *Ibid*, **110**, 1155.
Blowers, R., Wallace, K. R. (1955) *Lancet*, i, 1250.
Bourdillon, R., et al. (1948) Studies in Air Hygiene. *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 262.
— Colebrook, L. (1946) *Lancet*, i, 561, 601.
— Lidwell, O. M., Thomas, J. C. (1941) *J. Hyg., Camb.* **41**, 197.
Brehme, T. (1948) *Lancet*, ii, 604.
Brewer, G. E. (1915) *J. Amer. med. Ass.* **64**, 1369.

References continued at foot of next column

DIABETES IN JAMAICA

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IT is now generally agreed that diabetes mellitus is not one disease entity, but a syndrome (characterised by hyperglycæmia and glycosuria) which includes a group of disorders differing in their clinical features, biochemistry, and cause (Himsworth 1949).

There are two main clinical types (Lawrence 1951):

The first (called *type-1 diabetes* in this paper) starts in young people who are often underweight; it is severe in that the patient depends on the administration of insulin to prevent ketosis. The second (*type-2 diabetes*) is mild and characteristically arises in middle-aged patients who are often obese ("lipoplethoric" diabetes of Lawrence 1951) and seldom require insulin except during added infections.

These two types include most diabetics; the residue is composed of rare anomalous cases and those in whom the diabetes is associated with other specific endocrine disturbances.

Diabetes seemed to be of particular interest in Jamaica because general clinical observation suggested that a proportion of diabetics there behaved differently from those accepted types. Moreover both malnutrition and liver disease are common (Waterlow 1948, Hill et al. 1953). These facts, together with the wide range of local diets and living conditions, made treatment a special problem.

Methods of Inquiry

In the eighteen months from January, 1953, to June, 1954, an effort was made to review, in the diabetic clinic at the University College Hospital of the West Indies, every case of diabetes, known or suspected, coming to the hospital. During this time 215 patients were shown by blood-sugar estimations to have definite diabetes, and on all these the following information was recorded whenever practicable: sex, race, and locality of residence; age at onset of diabetes; serial weight records compared with average for height and age; serial blood-pressure records; clinical estimate of obesity; detailed analysis of diet before onset of diabetes; course of disease with relevant diet; insulin requirements in relation to blood-sugar level and ketosis; complications and associated pathological conditions; family history; local herbs ("bush teas") consumed; and, in some cases, liver-function tests and liver biopsy. The results were tabulated on punched cards and used for assessing the clinical types.

Unusual Varieties of Diabetes in Jamaica

Insulin Resistance in Youth (Type J)

Experience in Britain and the United States is that type-1 diabetics are sensitive to insulin and therefore readily develop hypoglycæmia if insulin is given very little in excess of their needs. Except when their illness is complicated by infection, they require relatively small doses to control glycosuria and to prevent the ketosis which readily develops without insulin. Lawrence (1951) says:

> "All diabetic children and most adults under 40 . . . are of this type. . . . Sometimes the disease is controlled at first by quite small doses of insulin—indeed, it may be given up for a time—but as months and years go on the majority become stabilised at insulin requirements of some 35 to 60 units a day."

Type-1 diabetics are found in Jamaica, but many cases in young adults under 40 and even in children there apparently do not conform to this type. These exceptions persistently require large doses of insulin to control glycosuria and so maintain their weight, are relatively insensitive to its action, and show little or no ketosis if insulin is withheld. Such cases will be called type J.

The presence of type-J diabetes in the present series can be seen from a scatter diagram relating modal insulin requirements, when balance was achieved, to the age of onset of the diabetes for each patient (see figure). At the same time, the obesity of the patient is shown and whether ketosis was ever recorded in the absence of infection. "Obesity" is measured by comparison of weight to the average expected from age and height, as given in tables reproduced by Duncan (1952) or as estimated clinically in the few cases where height was not recorded. The hatched area (age of onset below 45 years, insulin requirements below 50 units) in the figure shows the approximate limits for type 1 and contains most of the patients who could thus be classified, being underweight and having ketosis. A few patients who could be classed as type 2 come within this area. Most of the obese patients are among the large group at the bottom of the figure who need no insulin at all, show no ketosis, and scatter about an average age of onset corresponding to the menopause in women—i.e., 45–55 years (essentially type-2 cases). There are some, presumably type-2 cases, taking insulin, who may or may not need it, depending on infection and other complications. Some of the latter with ketosis and onset about 45–50 years cannot be distinguished from type 1; there is "overlap" as in the type-1 area, but on the whole the distinction is clear-cut. The young insulin-resistant type-J cases are delineated by the area enclosed by an interrupted line and stand out clearly from type 1.

Clinically, the type-J cases differ from the recognised sporadic cases of "insulin resistance," in which the resistance may temporarily be greater—these are usually defined as cases requiring more than 200 units of insulin daily for not less than forty-eight hours (Hubble 1954)—in that they show no gross fluctuations in their state but require a persistently large dose of insulin. Examples will help to show how type J differs in clinical features

DR. COLEBROOK: REFERENCES—*continued*

Chapin, H. D. (1915) *Arch. Pediat.* **32**, 724.
Colebrook, L. (1950) A new Approach to the Treatment of Burns and Scalds. London.
— Duncan, J. M., Ross, W. P. D. (1948) *Lancet*, i, 893.
— Hood, A. M. (1948) *Ibid*, ii, 682.
— Kenny, M. (1936) *Ibid*, i, 1279; *Ibid*, ii, 1323.
— et al. (1945) *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 249.
Cruickshank, R. (1944) *Brit. med. Bull.* **2**, 272.
Cullingworth, C. J. (1888) *Brit. med. J.* ii, 743.
Duguid, J. P., Wallace, A. T. (1948) *Lancet*, ii, 845.
Francis, A. E. (1942) *Ibid*, i, 408.
Gibson, J., Calman, R. M. (1953) *Ibid*, i, 320.
Hamburger, M., Green, M. J. (1946) *J. infect. Dis.* **79**, 33.
— — Hamburger, V. G. (1946) *Ibid*, **77**, 68, 96.
Hunt, E. L. (1933) *New Engl. J. Med.* **209**, 931.
Ivos, H. R., Hirschfeld, J. W. (1938) *Ann. Surg.* **107**, 607.
Jameson, J. E., Mann, T. P., Rothfield, N. J. (1954) *Lancet*, ii, 459.
Lancet (1949) Leading article, ii, 1089.
Lemon, H. M. (1943) *Proc. Soc. exp. Biol., N.Y.* **54**, 298.
Lowbury, E. J. L. (1954) *Lancet*, i, 292.
— (1955) *Brit. med. J.* i, 985.
Meleney, F. (1935) *Surg. Gynec. Obstet.* **60**, 264.
Mackerras, I. M., Mackerras, M. J. (1949) *J. Hyg., Camb.* **47**, 166.
Nuffield Provincial Hospitals Trust (1955) Studies in the Functions and Design of Hospitals. London.
Okell, C. C., Elliott, S. D. (1936) *Lancet*, ii, 836.
Ormiston, G. (1941) *Ibid*, ii, 588.
Peters, B. A. (1943) *Med. Offr*, **69**, 206.
Puck, T. T., Hamburger, M. jun., Robertson, O. H., Hurst, V. (1945) *J. infect. Dis.* **76**, 216.
Rogers, K. B. (1951) *J. Hyg., Camb.* **49**, 140, 152, 497.
Rountree, P. M. (1946) *Med. J. Aust.* i, 539.
— (1955) *Lancet*, ii, 172.
— Armytage, J. E. (1946) *Med. J. Aust.* i, 503.
Rubbo, S. D. (1948) *J. Hyg., Camb.* **46**, 158.
Sakula, J. (1943) *Lancet*, ii, 758.
Sauer, L. (1935) *J. Pediat.* **6**, 753.
Semmelweis, I. P. (1861) Reprinted in Medical Classics, vol. 5.
Sovitt, S. (1949) *Lancet*, ii, 1075.
— (1953) *Ibid*, ii, 1121.
Spooner, E. T. C. (1941) *J. Hyg., Camb.* **41**, 320.
Strahan, A. W. B. (1951) *Brit. J. Surg.* **38**, 276.
Thomson, J. (1952) *J. Obstet. Gynæc., Brit. Emp.* **59**, 483.
Wallace, H. L. (1947) *Edinb. Med. J.* **54**, 111.
Watkins, A. G., Lewis-Faning, E. (1949) *Brit. med. J.* ii, 616.
White, E. (1936) *Lancet*, i, 941.
Wright, J. (1940) *J. Hyg., Camb.* **40**, 647.
— Cruickshank, R., Gunn, W. (1944) *Brit. med. J.* i, 611.

and course from the usual type 1 of the same age of onset.

Case 1 (type J, thin, no ketosis).—A Negro girl, aged 17, developed diabetes with sudden onset of thirst and urinary frequency when she was 15 years old. She apparently had a "tropical" ulcer on her foot at the time and was kept for three months in another hospital, where, with daily insulin, the ulcer healed. On discharge she got insulin only erratically from a local clinic during the next two years. When we first saw her, she was very thin and weighed 94 lb., the average for her height (5 ft. 1 in.) and age being 113 lb. Her urine was brick-red to Benedict's solution. Her fasting blood-sugar level was 180 mg. per 100 ml., rising to 270 mg. per 100 ml. an hour after a test dose of glucose 50 g., but she had no ketosis in spite of an infected ulcer and small injection abscesses. Before admission she had been taking soluble insulin 80 units and protamine-zinc insulin 80 units, but often omitted injections, and her diet was 1400 calories, with about 160 g. of carbohydrate. In hospital she got 2400 calories and required soluble insulin 190 units and protamine-zinc insulin 50 units to control her glycosuria, and her weight increased to 108 lb. Subsequently it was found that a diet of 1670 calories was the most she could obtain away from hospital, yet her insulin requirements changed little. She is now balanced on 220 units of insulin zinc suspension (Lente) daily.

Some cases regarded as type J show ketosis in the presence of infection, but usually ketosis is conspicuous by its absence, in spite of the gross mismanagement of the diabetes which readily occurs in the poor social circumstances of many Jamaicans. Many cases are well balanced by a single large injection of soluble insulin each morning, as in case 2.

Case 2 (type J, thin, slight ketosis).—A coloured male, aged 28, developed diabetes and was seen after he had had injections of soluble insulin 20 units b.i.d. daily for about a week. His fasting blood-sugar level was 232 mg. per 100 ml., and he was very thin. His diet before the onset of his diabetes contained about 268 g. of carbohydrate but only 62 g. of protein and 60 g. of fat. He weighed 108 lb., compared with 135 lb. average for his age and height. He then defaulted from hospital and was admitted two weeks later with slight ketosis and urine brick-red to Benedict's solution. He was finally well balanced in hospital on soluble insulin 160 units each morning, and about 1850 calories, the latter being the most he could obtain away from hospital. Although he was taught to give his own injections he was careless in doing so and often went without insulin. He did not live near a clinic and often defaulted from hospital attendance. Over the course of a year he showed no ketosis, but he developed bilateral cataract and now awaits operation because he can barely see.

Temporary Diabetes

It is well known that reducing the weight of a patient with middle-age-onset, obese, type-2 diabetes to normal by dietary means may often "cure" the diabetes, in the sense that the abnormal glucose-tolerance curve becomes normal, and—so long as obesity is prevented—no detectable abnormality of carbohydrate or fat metabolism exists. Himsworth (1949) reports such a case, and we have observed several in Jamaica. This phenomenon contrasts with the sudden apparent cure of what could otherwise be regarded as type-1 diabetes. Diabetics who are underweight and insulin-sensitive, develop ketosis without infection, and show sudden spontaneous "cure," with an increase of weight during treatment, will be designated temporary diabetes—for example:

Case 3 (temporary diabetes, with ketosis).—A coloured woman, aged 43, about 5 lb. under the average weight for her age and height, was seen a week after the onset of diabetes. A glucose-tolerance curve showed her fasting blood-sugar level to be 350 mg. per 100 ml., rising to 485 mg. per 100 ml. an hour after, and 572 mg. per 100 ml. two hours after glucose 50 g. Her urine was red to Benedict's solution and gave a strongly positive Rothera's test, though she had no evident infection. Admitted to hospital she was initially stabilised on 1500 calories with 142 g. of carbohydrate and taught to give her own injections of soluble insulin 30 units daily. Before discharge her diet was increased to 2200 calories, but her insulin, when she was an outpatient, was progressively reduced, and after two months she needed no insulin at all. Six months later, having remained off insulin, her glucose-tolerance curve was 108 mg. per 100 ml. fasting, 177 mg. one hour, 152 mg. two hours, and 104 mg. three hours after glucose 50 g. After a year with no insulin it was 75 mg. per 100 ml. fasting, 111 mg. one hour, 120 mg. two hours, and 98 mg. three hours after glucose. Her weight increased by 7 lb. during the year. She has now been observed to have no apparent diabetes for nearly two years.

Mackenzie (1953) has reported similar temporary diabetes in Jamaica in his case 2, a man aged 34; but the first case he cites as being atypical may well be an example of the well-recognised "cure" in an obese type-2 diabetic. Dolger (1952) reports one case of complete remission of diabetes after a period of insulin resistance, and another, in a Negro woman in the U.S.A., has been reported by Cheng et al. (1953).

Associated Types

In Jamaica, as elsewhere, one sees isolated anomalous cases with much instability, or cases associated with other specific endocrine disturbance (e.g., disease of the suprarenal glands, Cushing's syndrome, or thyrotoxicosis.) These are not classed here as clinical types of diabetes per se but grouped together as "residue." In the present series 3 such cases were noted.

A man, aged 39, was initially thought to be a type-1 diabetic, but after over a year he developed signs of thyrotoxicosis associated with malignant exophthalmos. When these thyrotoxic disturbances appeared, the diabetic syndrome disappeared.

The two other patients showed gross instability; one may have a phæochromocytoma; the other, a man of 44, initially balanced on insulin 80 units daily, has intermittently become insulin-resistant and, in the absence of any obvious infection, required up to 400 units daily for short periods to control ketosis and hyperglycæmia.

This last case, in contrast to the permanent relative insulin resistance without ketosis in our young type-J diabetics, seems to be one of the rare cases of insulin resistance of unknown ætiology reviewed by Smelo (1948) and Hubble (1954).

Frequency of Different Types

On the basis of the following criteria the 215 consecutive patients were classified into types:

Type 1.—"Severe" diabetes needing insulin to prevent ketosis. Insulin-sensitive. Usually underweight. Usually developing under 40 years of age, but sometimes in old age (65 or over).

Type 2.—"Mild" diabetes. No ketosis without insulin unless complicated by infection. Often obese. Insulin-insensitive and relatively resistant but usually requiring no insulin on a suitable diet and sometimes "cured" by weight reduction. Middle age or late onset. When complicated by infection, require insulin and behave temporarily as a clinically different type (2b).

Type J.—Like type 1 but insulin-resistant (persistently over 80 units a day) and with much less tendency to ketosis. Onset in young, usually thin, subjects.

Temporary.—Diabetes in young subjects with ketosis, showing apparent spontaneous cure.

Residue.—Anomalous cases often associated with specific endocrine upset.

In allotting patients to the different types, chief attention was paid to insulin requirements, ketosis, and obesity: age of onset was not regarded as absolute.

Results

Table I shows the resulting classification. It is based on this small sample but otherwise should give a fair idea of the proportion of different types, since observer errors in classification or sample bias are thought to have little effect.

Observer Error

Table II shows the result of typing all the patients and then allotting them again into types on a second occasion

TABLE I—INCIDENCE OF DIFFERENT TYPES OF DIABETES IN 215 CONSECUTIVE CASES IN JAMAICA

Type	Male	Female	Total
1	18	8	26
2	57	115	172
J	7	6	13
Temporary		1	1
Residue	2	1	3
Total	84	131	215

without knowledge of the results of the first. Repeatability of typing is high, and the small error does not materially affect the results or conclusions reached. Sample typing by two other observers showed approximately the same consistency.

The greatest error is in allotting some cases to either type 1 or type 2; usually mild diabetes of early onset, or severe

TABLE II—REPEATABILITY OF CLASSIFICATION

Class	Second reading				
	1	2	J	Temporary	Residue
First reading:					
1	**23**	10	1	..	..
2	1	**157**	..	..	..
J	1	1	**12**	..	..
Temporary	..	3	..	**1**	..
Residue	1	1	..	..	**3**

Numerals in bold type indicate number of cases assigned to same diabetic type in two independent readings.

diabetes in overweight patients who might be either type 1, or type 2 with complications. More interesting and important are the other errors. Of the 3 cases classed as temporary diabetes on one occasion only 2 were initially slightly overweight (and therefore were not truly in the type as defined), but both showed "cure" of their diabetes with weight increase after their insulin had been reduced to nothing. However, both subsequently relapsed with infection and were finally classed in type 2. The 3rd may be a true example of temporary diabetes but has not yet been observed long enough, and the onset was rather late (43 years). Of the 2 placed in the "residue" on one occasion, one might have had some degree of thyrotoxicosis, and the other had an onset of diabetes associated with an operation for carcinoma of the pancreas. The type 1, called type J, on one occasion, had rather severe ketosis.

Nature of Sample

Most patients coming to the hospital are "casual" patients arriving for treatment from many parts of the island and not referred by doctors. Thus the great majority in the present series were of the peasant class mostly from the town of Kingston and the surrounding hill country, though all Jamaican parishes were represented.

Racially all patients were of Negro or a varying admixture of Negro-Caucasian stock, except 4 Chinese and 7 East Indians. These exceptions had type-2 diabetes. 3 white United Kingdom visitors to the island were excluded from the sample. Compared with the island census, the series is a reasonably proportionate sample of the community, and it is difficult to see how any selection bias from these factors can operate to affect the general conclusions. The only known bias was in those coming to the hospital during the trial period and not traced and seen in the clinic. 5 patients were treated by diet only in the "casualty" department, and there may have been a few others. A few patients admitted directly to surgical wards, because of gangrene, were excluded for various reasons. Both these lapses were presumably type-2 diabetes; so the proportion of these is, if anything, even greater than that suggested by table I.

Ætiology of Diabetic Types

Age and Sex

Table I and the figure show that in Jamaica, as elsewhere, there is the same predominance of type-2 diabetes in women about the menopause and of type-1 diabetes in men in early life.

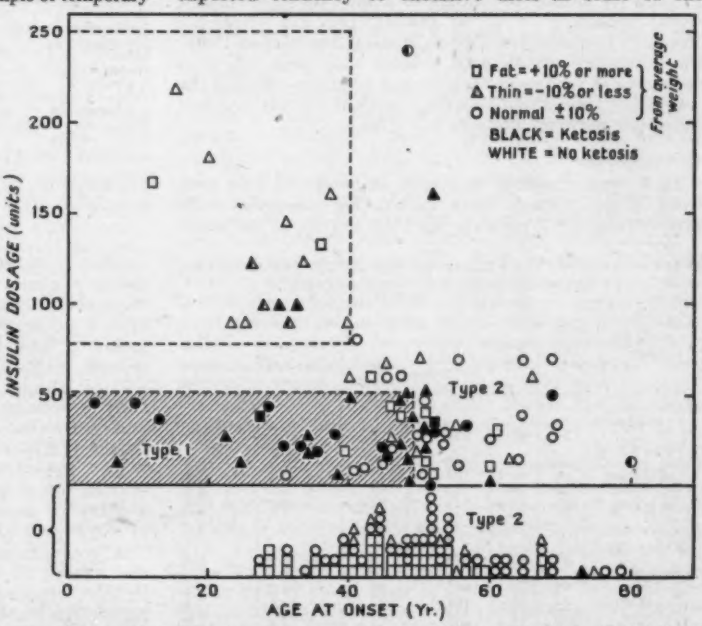
Heredity

Accurate family histories were often difficult to obtain, partly because so many births are illegitimate and there is usually more than one father to the family. Nevertheless it seems that inheritance played a more important part in diabetes of early onset than in that coming on after middle age. Of the 39 cases of early onset (types 1 and J) 20 were thought to give reliable information, and 6 (30%) of these gave a positive family history. Of the 172 patients with type-2 diabetes, 80 were thought to give reliable information and in only 11 (14%) of these was the family history positive.

Obesity and Diet

The importance of obesity in the ætiology of diabetes of middle-age onset, seen in the figure, has been emphasised by Duncan (1952), Joslin et al. (1952), and many others.

A detailed analysis of the diet before the onset of diabetes was made in 12 out of the 26 type-1 cases, 5 of the 13 type-J cases, and 99 of the 172 type-2 cases. There was not, on the average, a striking imbalance or deficiency in the diets, though individual examples of malnutrition were common. No clear-cut relation between diet and diabetic type was found except the expected tendency to excessive diets in some of the



Scatter diagram relating insulin dose, at balance, to age of onset of diabetes in 198 of 215 consecutive Jamaican cases (14 cases for which there were no records for any time without intercurrent infection have been omitted, likewise 3 cases in which the diabetes was associated with other overt endocrine disturbance).

TABLE III—AVERAGE DIET BEFORE ONSET OF DIABETES IN THE DIFFERENT CLINICAL TYPES

Type	Calories		Carbohydrates (g.)		Protein (g.)		Fat (g.)	
	Average	Range	Average	Range	Average	Range	Average	Range
1	2343	1428–3598	347 (71%)	217–718	75(15%)	46–111	66 (14%)	20–92
J	2164	1574–2916	318 (71%)	203–564	61 (14%)	48–71	66 (15%)	60–84
2 :								
Fat	2371	1224–6042	304 (64%)	145–647	79 (17%)	15–140	88 (19%)	31–318
Thin or indifferent	1969	1148–2765	262 (66%)	111–512	69 (17%)	15–120	66 (17%)	16–105

obese type-2 patients and the high proportion of fat in the diet in this class (table III). Himsworth (1949) thought that human diabetes was correlated with the amount of fat consumed.

It is interesting to contrast Africa with Jamaica; for in Africa diabetes in the Negro races appears to be uncommon although the diet contains a higher proportion of carbohydrate (Dean 1954). Whether this reputed difference in prevalence of diabetes is related to a lower total calorie intake of the African Negro is not known. The incidence of diabetes is reduced when food is short, as in Germany in 1917–18 (Lawrence 1951). Although the average total calorie intake shown in table III, like the amount of protein, is low in all classes, compared with the accepted dietary recommendation of about 3000 calories for adults (depending on energy requirements for work) including 70 g. of protein per day (National Research Council 1948, British Medical Association 1950), the totals for middle-aged women may well represent an excess of food over their energy requirement, and the associated type-2 diabetes may account for the believed difference between Jamaica and Africa.

TABLE IV—RELATION BETWEEN "HYPERTENSION" AND DIABETIC TYPE

Type	Total	Blood-pressure recorded	Systolic > 180 mm. Hg	Diastolic > 100 mm. Hg
1 and J :				
Male	25	21	1 (5%)	1 (5%)
Female ..	14	14	2 (14%)	3 (21%)
2 :				
Male	57	53	8 (15%)	14 (26%)
Female ..	115	110	44 (40%)	53 (48%)

Liver Disease

In 3 cases classified as type-2 diabetes the liver cells from biopsy showed some vacuolation consistent with fatty change in 2 patients aged 42 and 53 at the onset of diabetes, but normal histology with normal glycogen content in the 3rd case (a woman aged 74 at the onset of diabetes). The liver was quite normal in 1 type-1 case. These findings of fatty change in type-2 diabetes but a normal liver in type-1 diabetes agree with those of Bearn et al. (1951). Possibly, since type-1 diabetes may start in the very elderly (Lawrence 1951), the type-2 case with a normal liver was misclassified. Liver biopsy in 3 type-J cases revealed no remarkable histological change and an apparently normal glycogen content, thus grouping them with type 1 from their liver histology.

The 1 case of temporary diabetes showed normal glycogen storage at the time of the biopsy—i.e., after the diabetic state had gone; but the biopsy showed some portal fibrosis and portal infiltration with lymphocytes, plasma cells, and occasional eosinophils. The significance of these changes is not clear.

Liver-function tests in 25 cases of type-2 diabetes were completely normal in only 10. In the remaining 15 the cholinesterase level was low in 4, and 12 showed abnormality in one or more flocculation tests usually associated with a rather low serum-albumin level.

TABLE V—INDEPENDENT RELATION BETWEEN BLOOD-PRESSURE, DIABETIC TYPE, AGE, AND OBESITY

Diabetic type	No.	Age (yr.)	Blood-pressure (mm. Hg)			
			Systolic	Diastolic	Adjusted systolic	Adjusted diastolic
Males :						
Types 1 and J	21	36·5	120	76	− 11	+ 0·5
Type 2 :						
Fat ..	16	52	149	96	+ 12·5	+ 15·9
Indifferent	18	57·7	144	87	+ 2·5	+ 3·6
Thin ..	19	50·7	143	86	+ 6·0	+ 4·2
All types..	53	53·5	145·1	89·3	+ 6·7	+ 7·5
Females :						
Types 1 and J	14	37·6	135	82	+ 8·2	+ 9·6
Type 2:						
Fat ..	62	50	161	96	+ 21·2	+ 12·2
Indifferent	25	59	166	95	+ 12·4	+ 6·2
Thin ..	23	52	164	97	+ 24·6	+ 9·6
All groups	110	52·4	162·7	95·9	+ 19·9	+ 10·3

Average figures. For definition of age-adjusted B.P. score, see text.

TABLE VI—FREQUENCY OF COMPLICATIONS DIRECTLY RELATED TO DIABETES IN PATIENTS OF TYPES 1, 2, AND J

Complication	Types 1 and J (39 cases)	Type 2 (172 cases)
Ketosis	30 (77%)	41 (24·0%)
Coma or pre-coma	7 (18%)	1 (0·5%)
Cataract	4 (10%)	19 (11·0%)
Retinopathy	3 (8%)	11 (6·0%)
Neuropathy	7 (18%)	27 (16·0%)
Ulcer	4 (10%)	12 (7·0%)
Gangrene	0	9 (5·0%)
"Persistent" urinary infection	1 (3%)	17 (10·0%)
Other pyogenic infection (mostly boils, abscesses)	9 (23%)	17 (10·0%)
Pulmonary tuberculosis	1 (3%)	2 (1·0%)

Complications

Complications attributable to diabetes were common (table VI), and associated conditions much commoner than elsewhere. Thus of the 39 patients with either type-1 or type-J diabetes, 11 had other conditions, including bronchitis, syphilis, malaria, malnutrition and œdema, cirrhosis of the liver, carcinoma of the pancreas, uterine fibroids, gas-gangrene, and infective hepatitis. Only 1 woman was pregnant; she also had syphilis and gross cirrhosis of the liver and died before term. Of the 172 type-2 diabetics 75 had associated conditions.

If "hypertension" were arbitrarily defined as a systolic blood-pressure greater than 180 mm. Hg or a diastolic greater than 100 mm. Hg, it was common in the type-2 patients, especially the women (table IV).

A comparison of blood-pressure scores adjusted for the effects of age showed that the higher incidence in these type-2 patients could not be attributed to their higher age (table V).

The age-adjusted scores were made from tables given by Hamilton et al. (1954) and represent "the number of mm. . . . by which an observed B.P. reading exceeds or falls short of

the mean figure for the general population for that sex at that age, the scores being further adjusted to what that deviation would correspond to at age 60." This second adjustment is necessary because not only does the average pressure rise with age but also the scatter about that average increases.

It is often held that "essential hypertension" is very common in Jamaica, though awareness of "blood-pressure" among the population may partly account for the impression. However, measurements we have made to date show that the same average increase of blood-pressure with age and increase in scatter about the average occurs in Jamaica as in Britain; so the tables of Hamilton et al. seem appropriate for the age adjustment of the blood-pressure of these diabetics.

Bush Teas

Various herbs, leaves, or fruits of plants are commonly made into an infusion and drunk in Jamaica as a "bush tea." There are two kinds: regular bush used for "tea" (breakfast) each morning or at night, and "doctor" bush used as a cure for specific ailments. Asprey and Thornton (1953) have prepared an excellent list of such plants, carefully identified. No fewer than 43 species of plants were used for bush teas by the different patients in this diabetic series.

We have no information as to whether any of these "bushes" may actually cause diabetes. Certainly some regularly used plants may, in certain circumstances, apparently interfere with carbohydrate metabolism, probably by blocking liver enzymes. For example, there is evidence (*West Indian Medical Journal* 1953, Hassall and Reyle 1954) that a severe, and often fatal, toxic hypoglycæmia (known locally as "vomiting sickness") may be caused by the consumption of ackee (*Blighia sapida*), possibly if the fruit is unripe and the subject has little glycogen reserves as the result of previous starvation, though the fruit is normally a harmless and delicious food.

Many plants are credited with being cures for diabetes. Among those commonly taken to improve the "sugar" are: periwinkle (*Vinca rosea*), the white variety (var. *alba*) being used almost exclusively; mistletoe (*Phthirusa pauciflora*); nichol or nicker berry (*Cæsalpinea bonducella*); and rice bitters (*Andrographis paniculata*). Preliminary clinical trials of the first three of these plants were made to see whether they had any effect.

9 patients who understood the trial and had previously taken some form of "bush" were used. 5 were given white periwinkle leaves, but only 2 nichol-berry nuts and 2 mistletoe leaves, since these were less readily obtained. All had from four to nine days' rest in bed on a standard diet until their glycosuria was stabilised, and at least two duplicate glucose-tolerance curves were done before the particular "bush" was given for the subsequent trial, which lasted from five to eight days according to the supply of "bush." Glucose-tolerance curves were repeated at the end of the trial, and, in 4 cases the blood-sugar levels were measured fasting and an hour after food during the trial. All the bush teas were made exactly as in traditional recipes; but, since pilot experiments on volunteers showed that doses twice as large as those customarily taken gave no ill effects (except slight nausea with mistletoe), these high doses were used.

In the 2 patients given nichol berry, in 1 of the 2 given mistletoe, and in 1 of the 5 given periwinkle there was no demonstrable effect on either the blood-sugar or the urinary sugar level. 2 of the remaining 4 patients on periwinkle showed a slight fall both in urinary sugar and blood-sugar levels. In the remaining 2 on periwinkle and the other 1 on mistletoe there was a definite decrease in glycosuria but a rise in the blood-sugar level.

The fall in both blood-sugar and urine-sugar levels in the 2 patients on periwinkle cannot be attributed to a hypoglycæmic action of the herb, because the effects of diet alone could account for the results if the initial balance period were not in fact adequate. However, it is difficult to explain the rise of blood-sugar, accompanied by a fall in urine-sugar, in the 2 other cases given periwinkle and the 1 given mistletoe, except by assuming that the herbs were creating a renal "block"—presumably increasing the reabsorption of sugar in the proximal renal tubules and thereby acting in an opposite sense to phloridzin. This observation needs confirming pharmacologically; if it is correct, the bush teas so widely taken for diabetes in Jamaica may be harmful both to the general diabetic state and locally to the kidney.

In view of the known hypoglycæmic action of polypeptides extracted from ackee seeds (Hassall and Reyle 1954) trials of this plant in diabetes would be of great interest. But further experiments on animals are required first. The edible part of the fruit probably contains the hypoglycæmia-producing substance only in small and variable quantities. Insufficient extract of the polypeptides from the seeds was available from chromatography. Moreover, the seeds are not used as a bush remedy; so the safety of a crude preparation was unknown. Ackee might well be useful in type-2 diabetes, since glyconeogenesis appears to be depressed by it, and liver glycogen is depleted in clinical cases with the toxic hypoglycæmia of "vomiting sickness."

Treatment

The poor social circumstances of many patients, their illiteracy and fixed dietetic habits, and the presence of much insulin-resistant diabetes, combine to make treatment difficult in Jamaica. Diets prescribed in European textbooks are usually quite unsuitable; which means that patients are often given diet-sheets which are impracticable and which they ignore, or that insulin is taken, often spasmodically, without any effort in dietary control. The high prevalence of complications in the present series may reflect previous poor control of diabetes, and be an example, like others recently reported (Root 1949, Joslin et al. 1952, Dunlop 1954), of the long-term danger of "free diets" with neglect of hyperglycæmia and glycosuria. In Jamaica obese type-2 diabetics, especially, often suffer by taking insulin when they have no complications demanding it. Carbohydrate restriction and a reducing diet would control or even cure their diabetes; but on insulin they usually gain weight.

In preparing diets, the local habits of eating many different starchy vegetables at one meal (yams, sweet potatoes, rice and "peas," green bananas, plantains, cocos, breadfruit, &c.) have to be recognised; but, now that tables giving the composition of all local foods are available (Platt 1945, Ibersen 1953), practicable diet-sheets can be prepared. Two standard series of sheets, each with diets of 1500, 2000, 2500, and 3000 calories, were found necessary to cover upper and lower social groups; but even then they often required minor modification for individual patients. Simple carbohydrate equivalents were given, but any approximation to Lawrence's line-ration scheme (Lawrence 1955) proved too complex for most Jamaican patients. Some had to be given unsatisfactory diets because of economic necessity; but, if the diet were known and its carbohydrate value and fat ratio were maintained, they could usually be stabilised.

In spite of the social difficulties, experience showed that most diabetics who needed insulin could be taught to give their own injections if they were admitted to hospital initially. Admission was important both because of the wide range of mental aptitude and because of the different insulin sensitivity of young patients, some of whom proved to be type J and to need large doses of insulin. At regular outpatient attendances in the diabetic clinic, their weight, and the analysis of four specimens of urine from the previous day, gave enough evidence of whether they were keeping to their correct diet and insulin. If their eyesight was defective, syringes were

marked with waterproof tape, or adjustable metal stops were fitted, so that insulin dosage was still reasonably accurate. Providing syringes, and making patients responsible for their welfare rather than dependent on visits to local clinics for injections, led to better control and saved hospital admissions.

Most diabetics needing insulin were balanced on soluble or protamine-zinc insulin, or on both. Some type-J cases were found to be satisfactorily balanced throughout the day on a single large injection of soluble insulin in the mornings. Globulin was rarely needed. Isophane insulin ('N.P.H.') proved a satisfactory one-injection substitute for cases stabilised on both soluble and protamine-zinc insulin. However, the recent introduction of insulin-zinc suspensions (I.Z.S.) has meant easier and more stable balance in many cases; hence, in future, insulins other than these suspensions and soluble will probably rarely be needed. The balance in more than 40 patients, including type-J cases changed over to the I.Z.S., has now been observed for six months. It was maintained or improved in all of them, judged by the four urine specimens brought fortnightly to the clinic; but we could not make as many estimations of the blood-sugar levels each day as Paley (1954) recommends. About 10 patients volunteered that they felt better on I.Z.S. and had fewer insulin reactions.

Thus our experience supports, in Jamaican cases, the views of Oakley (1953), Murray and Wilson (1953), and Nabarro and Stowers (1953) in Britain about the usefulness of insulin-zinc suspensions. Only 2 patients were less well controlled on I.Z.S. than on their previous insulin, a much smaller percentage than that found by Fitzgerald et al. (1954). The standard Lente mixture of amorphous and crystalline suspension was satisfactory for all the patients except 2, both of whom were anomalous; they needed more of the quick-acting amorphous 'Semilente' suspension. So far we have not had to use the crystalline ('Ultralente') suspension. Change-over from two injections of soluble insulin, or of soluble insulin and protamine-zinc insulin, was usually simple, if the previous daily total was given as I.Z.S. lente and increased as required. We confirm, however, in the Jamaican cases the experience of Venning (1954) that some patients initially, and a few permanently, require more units daily on I.Z.S. lente than on other insulins; the former tend to become hypoglycæmic in the early morning as their requirements fall.

Discussion

The recognition of different clinical types of diabetes, as well as of regional variations in the syndrome, is not only important for logical treatment but also, with experimental work, helpful in understanding its pathogenesis.

Probably type-1 diabetes results from a primary deficiency of insulin, though histochemical correlation with β-cell change in the pancreas is often disappointing, and the cause of the damage to these cells unknown, unless recent work on alloxan, uric acid, and other inactivators of glutathione provides the clue (Lazarow 1954). Insulin sensitivity and ketosis are to be expected if there is an absolute insulin lack, and the demonstration by Bornstein and Lawrence (1951) of an absence of circulating plasma-insulin, in contrast to its presence in type 2, has confirmed this concept. That patients with type-1 diabetes from total pancreatectomy require relatively little insulin (Peters and Van Slyke 1946) possibly results from the concurrent lack of the insulin antagonist, glucogen, from the pancreatic α-cells (Sutherland and de Duve 1954).

Other clinical types of insulin-resistant diabetes seem to result not from a primary lack of insulin but from an excessive demand for it outstripping the supply or from the overproduction of insulin antagonists. The exact mechanism of type-2 diabetes is still doubtful. Most features of the clinical syndrome would be explicable by an excess of pituitary growth-hormone which might well accompany the hormonal changes of the menopause. Growth-hormone is experimentally diabetogenic only in the presence of plentiful nourishment (Campbell et al. 1954). It stimulates the production of insulin but neutralises the effect of insulin on the blood-sugar level and at the same time impairs the utilisation of fat (de Jongh 1954). Thus growth-hormone with plentiful nourishment and circulating insulin would account for the clinical insensitivity to insulin, the obesity, the lack of ketosis, the improvement by dietary restriction, and the fat in the liver.

Whether type-J cases represent a clinical entity wholly different from type-1 cases, or are merely this variety of diabetes behaving in an unusual manner, needs further study. In their age and mode of onset and in their liver biopsy they resemble type-1 cases, but their insulin resistance and relative lack of ketosis suggest a supply of free insulin. Plasma-insulin assays (Bornstein and Lawrence 1951, Vallance-Owen and Hurlock 1954, Randle 1954) and measurement of liver-glucose output by hepatic-vein catheterisation (Bearn et al. 1951) would help to decide whether they lack insulin or not; if not, they must be "immune" to its action or have an antagonist or excessive glycogenolytic factor, such as that from the pancreatic α-cells, causing the insulin resistance and preventing ketosis (Thorogood and Zimmermann 1945). The latter mechanism has been suggested (*Lancet* 1952) to account for the similar behaviour of diabetics with Kimmelstiel-Wilson kidney lesions as opposed to those without or with other types of renal damage (Zubrod et al. 1951).

Temporary diabetes is evidently rare, because only 1 case (possibly 2) occurred in the present series of 215 consecutive patients. Nevertheless its existence is of interest in understanding the pathogenesis of diabetes, and we know of other cases in Jamaica which may prove to be of this variety. Other published cases (Mackenzie 1953, Cheng et al. 1953) have also been in Negroes. On the basis of the liver biopsy of the 1 case in the present series it seems reasonable to suppose that it might be the clinical counterpart of the diabetic syndrome arising from partial hepatectomy (Himsworth 1949).

Summary

An analysis of 215 diabetic patients consecutively attending hospital in Jamaica showed that they could be divided clinically into the two main types seen elsewhere: type 1, of early-age onset, insulin sensitive, and ketotic (26 cases); and type 2 of middle-age onset, insulin-resistant, with a tendency to be obese but not to have ketosis, if without insulin, unless they have an infection (172 cases, nearly three-quarters in women).

A third variety, not previously described, also occurred (type J, 13 cases). It was peculiar in its onset in young thin people who were, however, relatively insulin-resistant and lacking in ketosis.

The significance of type J as well as of some sporadic cases of temporary diabetes seen in Jamaica is discussed in relation to the pathogenesis of diabetes in man.

Liver biopsy in 3 cases of type-J diabetes showed them to resemble type-1 diabetes in that the liver was normal, in contrast to the fatty change common in type-2 diabetes.

Preliminary trials with local plants, reputed to cure diabetes, were unconvincing, though periwinkle (*Vinca rosea*) and mistletoe (*Phthirusa pauciflora*) may raise the renal threshold for sugar. Clinical trials with ackee (*Blighia sapidia*), which is known to cause hypoglycæmia, could not, it was felt, be undertaken without more information.

Complications of diabetes were common and may reflect the results of "free diets." Hypertension was particularly associated with type-2 diabetes independently of the effects of age, sex, and obesity.

Points about the local management of diabetes are presented in relation to diets, social conditions, prevalence of insulin resistance without ketosis, and the value of using insulin-zinc suspensions.

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ADDENDUM

Since this article was written Dr. R. A. Pallister has reported 2 cases to me from Malaya with insulin resistance and relative lack of ketosis, and I have had a similar report of many cases with a lack of ketosis from the University College Hospital, Ibadan, Nigeria. This suggests that "type J" diabetes may be generally common in tropical countries. A further case of temporary diabetes was seen in the diabetic clinic at Hammersmith Hospital, London, but again in a Negro patient referred while he was visiting Britain, by Dr. G. L. Money from Ibadan. However, the recent article by Downie (1955) reports fluctuation with temporary cure of established diabetes in non-Negro patients.

REFERENCES

Asprey, G. F., Thornton, P. (1953) *West Ind. med. J.* **2**, 233.
Bearn, A. G., Billing, B. H., Sherlock, S. (1951) *Lancet*, ii, 698.
Bornstein, J., Lawrence, R. D. (1951) *Brit. med. J.* i, 732.
British Medical Association (1950) *Ibid*, i, 541.
Campbell, J., Munroe, J. S., Hansler, H. R., Davidson, I. W. F. (1954) *In* W.H.O. Symposium on Experimental Diabetes. Oxford.
Cheng, T. O., Jahraus, R. C., Traut, E. F. (1953) *J. Amer. med. Ass.* **152**, 1531.
Dean, R. F. A. (1954). Personal communication.
de Jongh, S. E. (1954) *In* W.H.O. Symposium on Experimental Diabetes. Oxford.
Dolger, H. (1952) *Med. Clin. N. Amer.* **36**, 783.
Downie, E. (1955) *Brit. med. J.* ii, 863.
Duncan, G. C. (1952) Diseases of Metabolism. 3rd ed., Philadelphia.
Dunlop, D. M. (1954) *Brit. med. J.* ii, 383.
Fitzgerald, M. G., Thorn, P. A., Malins, J. M. (1954) *Lancet*, i, 187.
Hamilton, M. Pickering, G. W., Roberts, J. A. F., Sowry, G. S. (1954) *Clin. Sci.* **13**, 37.
Hassall, C. H., Reyle, K. (1954) *Nature, Lond.* **173**, 356.
Hill, K. R., Rhodes, K., Stafford, J. L., Aub, R. (1953) *Brit. med. J.* i, 117.
Himsworth, H. P. (1949) *Lancet*, i, 465.
Hubble, D. (1954) *Brit. med. J.* ii, 1022.
Ibersen, D. (1953) Food values for Caribbean Foods, compiled from various sources (not published).
Joslin, E. P., Root, H. F., White, P., Marble, A. (1952) The Treatment of Diabetes Mellitus. London.
Lancet (1952) i, 653.
Lawrence, R. D. (1951) *Brit. med. J.* i, 373.
— (1955) The Diabetic Life. 15th ed., London.
Lazarow, A. (1954) *In* W.H.O. Symposium on Experimental Diabetes. Oxford.
Mackenzie, I. F. (1953) *West Ind. med. J.* **2**, 185.
Murray, I., Wilson, R. B. (1953) *Brit. med. J.* ii. 1023.
Nabarro, J. D. N., Stowers, J. M. (1953) *Ibid*, p. 1027.
National Research Council (1948) Food and Nutrition Board, N.R.C.: Recommended Dietary Allowances. Washington.
Oakley, W. (1953) *Brit. med. J.* ii, 1021.
Paley, R. G. (1954) *Lancet*, ii, 784.
Platt, B. S. (1945) *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 253.
Peters, J. P., Van Slyke, D. D. (1946) Quantitative Clinical Chemistry Interpretations. Baltimore.
Randle, P. J. (1954) *Lancet*, i, 441.
Root, H. F. (1949) *Amer. J. med. Sci.* **217**, 545.
Smelo, L. S. (1948) *Proc. Amer. Diabetes Ass.* **8**, 75.
Sutherland, E. W., de Duve, C. (1948) *J. biol. Chem.* **175**, 663.
Thorogood, E., Zimmermann, B. (1945) *Endocrinology*, **37**, 191.
Vallance-Owen, J., Hurlock, B. (1954) *Lancet*, i, 68.
Venning, G. R. (1954) *Ibid*, p. 480.
Waterlow, J. C. (1948) *Spec. Rep. Ser. med. Res. Coun., Lond.* no. 263.
West Indian Medical Journal (1953) **2**, 93.
Zubrod, C. G., Eversole, S. L., Dana, G. W. (1951) *New Engl. J. Med.* **245**, 518.

THE PALLIATION OF BRONCHIAL CARCINOMA BY RADIOTHERAPY

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THE value of palliative X-ray therapy in bronchial carcinoma—meaning sufficient irradiation to relieve symptoms without attempting to prolong life—has been disputed. The present investigation was undertaken to determine the most suitable type of case for such treatment. The increasing incidence of bronchial carcinoma (Doll 1953) suggests that this will become a larger problem unless earlier diagnosis or more effective methods of treatment become possible.

Material

The patients were seen for the first time at the radiotherapy departments of the Middlesex and Mount Vernon Hospitals between August, 1953, and January, 1954. Only those receiving palliative X-ray therapy were accepted, which entailed the rejection of patients having radical courses or radiation after resection.

90 consecutive patients were examined, but 21 were rejected, 4 because the diagnosis was incorrect and 17 because of insufficient data. 69 patients remained, 59 males and 10 females—a male-to-female ratio of 6 to 1. The age-distribution in table I shows that most of the patients were in the seventh decade. The diagnosis was confirmed histologically in 35 patients, and analysis of the effect of treatment is restricted to these. The The histological type of carcinoma was as follows:

TABLE I—AGE AND SEX OF SIXTY-NINE PATIENTS

	Sex		Age (years)					
—	Total	Ratio	0–29	30–39	40–49	50–59	60–69	70 or more
Male ..	59	6	0	2	14	17	24	2
Female ..	10	1	0	0	0	7	3	0

Squamous-cell	.. ..	15	43%
Oat-cell	.. ..	11	57%
Other ..	.. ..	9	

Method

At the first interview the history was taken and a clinical examination made, followed by a chest radiograph. Subsequently every patient was seen on several occasions during and after irradiation. As the investigation was concerned with palliation, particular note was made of the presence or absence of symptoms. Moreover, it was essential to estimate the severity of symptoms, so that the variation, either waxing or waning, after treatment could be recorded. The following scheme was adopted:

Dyspnœa was assessed clinically and based on the five grades suggested by Fletcher (1952):

1: the patient's breath is as good as that of other men of his own age and build, at work, on walking, and on climbing hills or stairs.

2: the patient can walk with normal men of his own age and build on the level but cannot keep up on hills or stairs.

3: the patient cannot keep up with normal men on the level but can walk about a mile or more at his own speed.

4: the patient cannot walk more than about 100 yards on the level without a rest.

5: the patient is breathless on talking or undressing, or cannot leave his house, because of breathlessness.

Cough was assessed as occasional, troublesome, or causing disturbed sleep.

Chest pain was best classified into three types:

(1) "Invasive," associated with periosteal, bone, plexus or intercostal-bundle involvement by direct extension.

(2) "Mediastinal," described as a midline pain radiating through the middle of the chest and sometimes associated with dysphagia. This may be accompanied by enlargement of the mediastinal and subcarinal glands.

(3) "Visceral," a dull ache in the affected hemithorax, sometimes radiating through to the subscapular region and usually associated with an intrapulmonary mass.

The severity of the pain was assessed as mild, causing disturbed sleep, requiring regular analgesics, or necessitating surgery.

Obstruction of superior vena cava was assessed by inquiring into dizziness on stooping and increase of collar size, and by measuring the circumference of the neck.

Constitutional disturbance, included malaise, lassitude, sweats, and fever.

In the clinical and radiological examination attention was given to evidence of pulmonary collapse, consolidation, effusions, metastases, and obstruction of the superior vena cava. The serial radiographs were read personally, particular attention being paid to changes in the extent of collapse, consolidation, size of effusions, and masses. "Radiological regression" denotes re-aeration of an atelectatic segment, lobe, or lung, and diminution in the size of a pleural effusion or an intrapulmonary or glandular mass.

Treatment

In most cases X-ray therapy was by anterior and posterior chest fields, but a few cases had extra ports. 7 patients were treated with grids. The average over-all course was 2942r at 220–250 kV and 10–17 mA spread over seventeen treatments given during thirty-one days in hospital. The dosage differed at the two centres, one giving an average of 3722r in twenty-three treatments, the other 2161r in twelve treatments. Otherwise there was no significant difference in the treatment received. Some patients received antibiotics in addition to X-ray therapy; they were considered separately when change in constitutional symptoms was assessed.

TABLE II—SYMPTOMS AND SIGNS RELIEVED BY PALLIATIVE RADIOTHERAPY IN 35 HISTOLOGICALLY PROVED CASES OF CARCINOMA OF BRONCHUS

Symptom or sign	Cases suitable for analysis	Improved
Chest pain :	13	7
Mediastinal	3	3
Visceral	6	4
Invasive	4	0
Cough	25	19
Dysphagia	4	3
Dyspnœa	24	14
Hæmoptysis	13	7
Obstruction of superior vena cava	6	5

Results

These comments are restricted to the 35 patients in whom the diagnosis was confirmed histologically. This is, therefore, too small a series from which to draw statistical conclusions.

The results are shown in table II, which shows that dyspnœa was reduced in more than half, cough alleviated in three-quarters, and dysphagia relieved in three-quarters of those who had it. Mediastinal and visceral chest-pains were usually relieved, but radiation had no effect on invasive pain. Hæmoptysis improved in more than half, and obstruction of the superior vena cava was relieved in 5 of 6 cases with this complication.

Turning from isolated symptoms, it is necessary to consider the patient, who usually had more than one disability, as a whole. 21 (60%) showed general improvement. They included 8 (53%) of the 15 patients with squamous-cell carcinoma and 13 (65%) of the 20 with oat-cell and other histological types of growth; this suggests that the latter are more radiosensitive than the former. 17 (49%) were able to lead an independent life, and 6 (17%) returned to work.

12 patients had constitutional disturbance associated with bronchial infection: 4 given antibiotics and radiotherapy improved; and of the 8 who received radiotherapy alone only 5 improved.

In 17 patients who showed symptomatic relief, and where radiological correlation was possible, radiological regression was seen in 13, but in the other 4 the condition was stationary or worse.

As regards the site of the growth, the upper lobe was involved in 20 patients, of whom 14 (70%) were improved by radiotherapy. The lower lobe was affected in 11, of whom 7 (64%) were relieved. The growth infiltrated the main bronchi in 4 patients, all of whom deteriorated.

TABLE III—COMPARISON OF RESULTS OF LARGE AND SMALL DOSAGE OF X RAYS FOR PALLIATION OF CARCINOMA OF BRONCHUS

—	Large-dose group	Small-dose group
Number treated	12	23
Proportion of squamous-cell : oat-cell carcinoma	1 : 1·4	1 : 1·3
Dose of X rays	3722r	2161r
Number of treatments	23	12
Days in hospital	43	20
Percentage of cases improved	58	61

The results of two different dosage schemes (table III) were about the same in both groups. Patients treated with a grid (table IV) did not appear to fare better, but the number of cases is small.

Discussion

In most patients with carcinoma of the bronchus no attempt can be made to cure the established disease. Unfortunately resection, the only hope for cure, is possible in only a few. At the joint consultative clinic at the Brompton Hospital 3·9% were resected (Brooks et al. 1951); and 35% of those seen in a surgical clinic (Ochsner et al. 1952) and 17% of those seen in a general hospital (Aufses 1953) were resectable. Later work at the joint consultative clinic (Bignall 1955) showed that 18% were resected; this increase probably reflects earlier diagnosis. Of the remaining patients some are treated by radical X-ray therapy and some by chemotherapy. In most of them no attempt can be made to prolong life; Bignall (1955) points out that there is unlikely to be any improvement in this situation, and suggests that attention should be directed to effective palliation.

Some distressing symptoms may be relieved by palliative X-ray therapy, but all cases are not suitable, and patients must be selected. Patients with lassitude, malaise, fever, sweats, anorexia, nausea, and vomiting, probably indicating metastases in the liver, are often too weak to withstand the treatment and may be worsened by it.

Case 1.—[53/798.] A male metal polisher, aged 46, had an acute chest infection which left him, in April, 1953, with shortness of breath and an unproductive cough. At bronchoscopy in September, 1953, a squamous-cell carcinoma was found in the right main bronchus, involving the trachea.

First seen September, 1953.—Anorexia, nausea, grade-2 dyspnœa, an occasional dry cough, and physical signs of a collapsed right lung (confirmed by radiography).

TABLE IV—COMPARISON OF RESULTS OF PALLIATIVE X-RAY THERAPY GIVEN BY OPEN AND GRID FIELDS IN CARCINOMA OF BRONCHUS

—	No grid	Grid
Number treated	28	7
Proportion of squamous-cell : oat-cell carcinoma	3 : 4	3 : 4
Percentage of cases improved	61	57

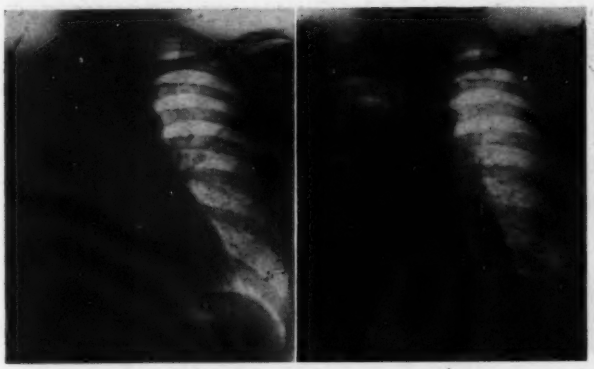

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Fig. 1—Case 2 before and after treatment.

Treatment.—1020r in six treatments over eight days at 220 kV and 10 mA.

Result.—During treatment he developed fever, lassitude, sweats, troublesome cough, and dyspnœa on the slightest exertion. Penicillin had no effect, and X-ray therapy was abandoned.

Disposal.—He was transferred home, confined to bed, and died a month later.

This case illustrates the poor response of a squamous-cell growth invading the main bronchus in a patient with severe constitutional disturbance.

Multiple metastases may make the patient unsuitable, but occasionally irradiation of the metastases and the chest is warranted. As with any other form of treatment, patients should be selected because certain symptoms indicate the need for treatment with a view to making their life easier and not because "one must do something."

The symptoms and signs most likely to respond are obstruction of the superior vena cava, cough, dysphagia, "mediastinal" and "visceral" chest pain, hæmoptysis, and dyspnœa. The following two cases illustrate the relief of obstruction of the superior vena cava:

Case 2.—[53/671.] A lorry driver, aged 43, had a hæmoptysis in April, 1953. Bronchoscopy showed an undifferentiated carcinoma of the right upper-lobe bronchus. While he was awaiting admission obstruction of the superior vena cava gradually developed.

First seen in August, 1953.—Dizziness on stooping, swelling of the face and neck, grade-3 dyspnœa, troublesome cough with a trace of mucopurulent sputum, and mild right-chest "visceral" pain. Examination showed the signs of obstruction of the superior vena cava with œdema, a collapsed right upper lobe, and a right pleural effusion.

Treatment.—2400r in sixteen treatments over twenty-one days at 220 kV and 10 mA.

Result.—The symptoms and signs of obstruction of the superior vena cava, dyspnœa, and chest pain were relieved. Radiologically the right pleural effusion cleared (fig. 1), and the patient was left with an occasional cough and a trace of mucopurulent sputum.

Disposal.—Three weeks after discharge he returned to work, driving a 5-ton timber lorry, which he helped to load. He continued this for six months and then led a restricted life until he died from heart-failure a year after his first attendance.

This case illustrates the excellent response of an undifferentiated carcinoma causing obstruction of the superior vena cava. The relief of this syndrome permitted the patient to pass his remaining year in moderate comfort.

Case 3.—[54/73.] A slaughterman, aged 47, had an acute chest infection in December, 1953. This cleared after treatment. In January, 1954, he gradually developed the symptoms and signs of obstruction of the superior vena cava. At bronchoscopy there was distortion of the right upper-lobe bronchus. Biopsy of a supraclavicular gland showed replacement by oat-cell carcinoma.

First seen in January, 1954.—Dizziness on stooping, swelling of the face and neck, blurring of vision, grade-3 dyspnœa, and occasional cough with 1 oz. of mucopurulent sputum. Examination showed gross symptoms and signs of obstruction of the superior vena cava, with œdema and a neck circumference of 18 inches. There were large axillary glands.

Treatment.—2016r in sixteen treatments over twenty-two days at 220 kV and 10 mA.

Result.—The symptoms and signs of obstruction cleared, the neck circumference being diminished by $3^1/_2$ inches. The cough became dry, but the other symptoms remained. Radiologically the congested lung fields had cleared, there were small bilateral pleural effusions, and the mass at the right hilum had diminished (fig. 2).

Disposal.—The patient was confined to bed at home with multiple metastases and died a month later.

This patient illustrates the good response of an oat-cell carcinoma; the growth shrank and relieved the pressure on the superior vena cava.

The following case illustrates relief of "mediastinal" chest pain and dysphagia:

Case 4.—[H. 54974.] A postman, aged 44, had dyspnœa, cough, and a trace of mucoid sputum in June, 1953. Radiography of his chest showed a collapsed right upper lobe. Bronchoscopy (August, 1953) showed a squamous-cell carcinoma of the right upper-lobe bronchus.

First seen in August, 1953.—Lassitude, malaise, grade-3 dyspnœa, wheezing, troublesome dry cough, and mild midline chest pain of "mediastinal" type with dysphagia. Examination revealed stridor and collapse of the right upper lobe.

Treatment.—4516r in thirty treatments over forty-four days at 250 kV and 10 mA.

Result.—The constitutional symptoms, pain, and dysphagia were relieved. The dyspnœa improved from grade 3 to grade 2, and the cough became occasional. The right upper lobe was re-aerated, and the mass at the right hilum diminished (fig. 3).

Disposal.—The patient led an independent life at home for six months; then his dyspnœa and cough worsened, and obstruction of the superior vena cava developed. This was treated, but he developed a chest infection which did not respond to antibiotics and he died.

This squamous-cell carcinoma in the right upper-lobe bronchus responded well, the patient getting relief from

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Fig. 2—Case 3 before and after treatment.

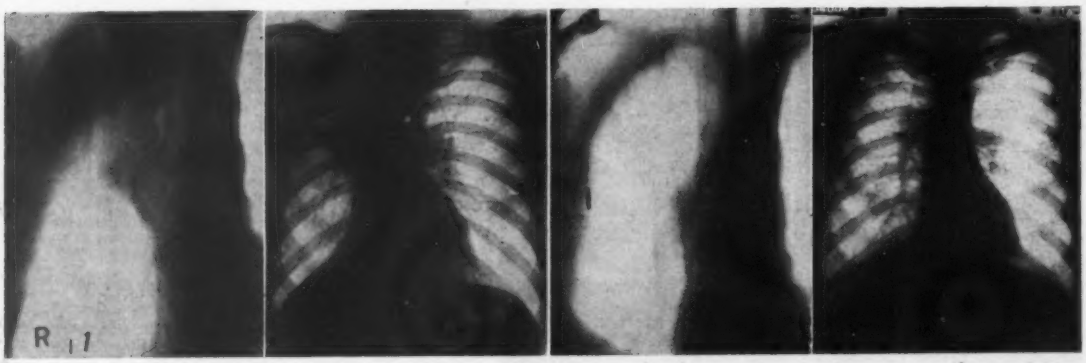

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Fig. 3—Case 4 before and after treatment.

the pain and dysphagia which resulted from mediastinal glandular metastases.

This next case illustrates the relief of dyspnœa, cough, and sputum:

Case 5.—[53/898.] A woman fishmonger, aged 53, had a right basal pleurisy in March, 1953. It cleared in a week, but she had a further chest infection in May, with blood-streaked sputum for two or three days. Bronchoscopy in September, 1953, showed an oat-cell carcinoma of the right lower-lobe bronchus.

First seen November, 1953.—Grade-3 dyspnœa, a troublesome cough, 1 oz. of mucoid sputum, and wheezing. Examination showed collapse of the right middle and lower lobes.

Treatment.—2178r in eleven treatments over fifteen days at 220 kV and 10 mA.

Result.—Her dyspnœa improved to grade 2, her cough became occasional, and her sputum a trace. She still complained of wheezing. Clinically and radiologically there was re-aeration of the right middle and lower lobes (fig. 4).

Disposal.—She returned home able to manage housework. In March, 1954, she had an enlarged solitary deep cervical gland on the right side which regressed after local X-ray therapy. She died in July, 1954.

Obstruction of the superior vena cava with a gradual onset due to pressure from enlarging glands should be differentiated from the sudden onset of thrombosis due to invasion of the vein wall by growth, the former responding well, the latter poorly. Any patient with obstruction of the superior vena cava deserves a trial of palliative X-ray therapy because the chances of relief are good and death from such obstruction is extremely unpleasant.

As regards chest pain, both the "visceral" and the "mediastinal" types respond well, but the "invasive" type responds poorly.

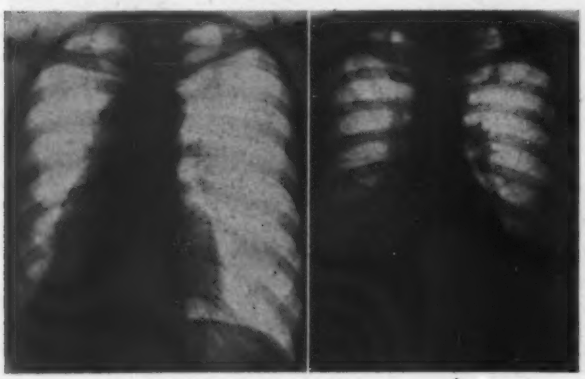

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Fig. 4—Case 5 before and after treatment.

A tumour in the superior sulcus involving the upper dorsal nerves or the brachial plexus is a different problem. Analgesics are taken in increasing doses, the patient usually being relatively well, apart from pain. Recent interest in the effect of sympathetic denervation in pain prompted a trial of cervical sympathectomy in such a case:

Case 6.—[H. 45838.] A storeman, aged 67, had left-sided chest pain and a troublesome cough in June, 1952. In the following January his sputum was streaked with blood, and radiography of his chest showed a shadow in the left upper zone, which thoracotomy revealed to be due to a poorly differentiated squamous carcinoma. During February, 1953, before this investigation was started, he had a course of palliative X-ray therapy.

Seen in August, 1953, he had left upper chest pain of "invasive" type radiating to the left subscapular region and down the left arm, so severe as to require regular analgesics. He had a troublesome cough with a trace of blood-streaked sputum. On examination there was tenderness over the left upper chest.

Treatment.—2402r in eleven treatments over sixteen days at 230 kV and 15 mA.

Result.—The hæmoptysis ceased, and the cough improved, but the pain and tenderness remained. There was no radical change.

Disposal.—He returned to work until February, 1954, when the severity of the pain demanded further treatment. A stellate-ganglion block with local anæsthetic having alleviated the pain, left cervical sympathectomy was performed in June, 1954. This relieved the pain for three months, but he was then compelled to return to regular analgesics.

This patient illustrates the poor response of "invasive" pain due to invasion of the chest wall by a peripheral growth. Such patients suffer greatly and warrant trial of other measures to give them some symptomatic relief.

In any patients with bronchial carcinoma one of the major factors in prognosis is the histological type of growth. This applies to the response to palliative X-ray therapy, and in this series 53% of squamous-cell growths improved, compared with 65% of the others improved. Brown (1952) found that 19% of squamous-cell growths improved, compared with 57% of anaplastic. These figures reflect the greater radiosensitivity of oat-cell and of undifferentiated tumours, which are consequently more effectively treated by a palliative course of irradiation. Concerning the site of the tumour, growths of the upper-lobe responded slightly better than those of the lower-lobe, and all the growths occluding the main bronchus responded poorly.

In this series the results obtained with an average dose of 2161r in twelve treatments were not improved by increasing the dosage. Brown (1952) also found that the percentage improvement was the same for a dosage of 2000–3000r as for one of 4000–5000r.

Antibiotics may also be needed in patients with infection distal to bronchial occlusion. 4 such patients so treated all improved, whereas only 5 of 8 treated by X-ray therapy alone improved.

Most patients develop erythema and pigmentation at the site of treatment. Some had anorexia and slight nausea, but none developed radiation sickness. In case 1 treatment had to be abandoned, but this was probably because the disease was so far advanced.

Summary

The effect of palliative X-ray therapy in 35 patients with histologically proved bronchial carcinoma is analysed.

Symptoms were relieved as follows :

Obstruction of superior vena cava	in 83%
Cough	in 76%
Dysphagia	in 75%
Hæmoptysis	in 64%
Chest pain :	
Mediastinal	in 100%
Visceral	in 66%
Invasive	in 0
Dyspnœa	in 58%

After treatment 60% of patients had improved as regards their general condition, 49% were able to live independently, and 17% returned to work.

The most effective course was an average dose of 2161r given in twelve treatments. Higher dosage and longer treatment produced no better results.

Squamous-cell tumours did not show such good results as did other histological types.

Upper-lobe growths responded slightly better than lower-lobe growths.

This work was done on a grant from the Middlesex Hospital Clinical Research Committee, and I should like to thank Prof. B. W. Windeyer, Miss M. D. Snelling, Dr. W. R. Ward, and Dr. L. G. D. Picciotto for permission to study cases under their care. From Dr. Arthur Willcox, who suggested the survey, I have had much encouragement and advice. I am also grateful to Dr. A. J. H. Hewer for his help with case 6 ; to the radiological, pathological, and records departments of the Middlesex and Mount Vernon Hospitals ; and to Miss M. L. Autin and to Mrs. C. L. Burton for secretarial assistance.

REFERENCES

Aufses, A. H. (1953) *J. Mt. Sinai Hosp.* **20**, 212.
Bignall, J. R. (1955) *Lancet*, i, 786.
Brooks, W. D. W., Davidson, M., Thomas, C. P., Robson, K., Smithers, D. W. (1951) *Thorax*, **6**, 1.
Brown, D. E. M. (1952) *Brit. J. Radiol.* **25**, 472.
Doll, R. (1953) *Brit. med. J.* ii, 521.
Fletcher, C. M. (1952) *Proc. R. Soc. Med.* **45**, 577.
Ochsner, A., DeCamp, P. T., DeBakey, M. E., Ray, C. J. (1952) *J. Amer. med. Ass.* **148**, 691.

"... The great advantage enjoyed by the physician of an earlier age was that he saw his patients as whole persons and familiar friends. He saw them in health as well as in sickness. He dealt with birth, childhood, maturity and old age, and with all common ailments. His technique was meagre but he possessed it all. ... Hippocrates legislated only for the responsibility of an individual physician attending a patient or a few patients in a single family. Even now, that is how it generally begins and ends, at the beginning of life and the end of it. But in between something else has crept in, something unknown to Hippocrates. We now have to worry about collective responsibilities and especially about public health. In the interest of public health individual interests may have to give way. Nobody has formulated rules about this yet and I do not envy anybody who tries. At present it means that physicians sometimes violate the Hippocratic Oath in a small way, and nobody except the physician takes much notice. They might find themselves doing it in a large way and then the trouble would begin. This is a pointer to one of the difficulties of the new age ; we have no codes and no traditions about collective moral responsibility ; we have on the other hand a great deal of detailed legislation which does not command moral respect. 'Thou shalt not steal' does command moral respect. 'Thou shalt not park thy car on the left hand side of the road on odd days of the month, nor yet ...' does not."—Prof. A. D. RITCHIE, *Univ. Edinb. J.*, summer number, 1955 ; p. 233.

ACTIVE VENTILATION IN TREATMENT OF RESPIRATORY ACIDOSIS

IN CHRONIC DISEASES OF THE LUNGS *

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INCREASED experience in Denmark with artificial ventilation, partly through work during the epidemic of poliomyelitis in 1952 (Lassen 1953), has aroused interest in the numerous possibilities of this treatment. We report here some investigations into the effects of different methods of ventilation in the treatment of respiratory acidosis in patients with chronic bronchitis with pulmonary emphysema.

Chronic pulmonary emphysema reduces the alveolar ventilation, and this reduction may gradually lower the oxygen saturation and increase the carbon-dioxide tension ($p CO_2$) of the arterial blood. In spite of the increase in $p CO_2$ the pH of the blood is generally normal (compensated acidosis). In acute impairment of the function of the lungs, due to infection, accumulation of secretion, or the administration of morphine, the $p CO_2$ increases further, the pH decreases (uncompensated acidosis), and extreme cyanosis and unconsciousness develop. If this condition is not dealt with, the increased $p CO_2$ will paralyse the respiratory centre, ventilation will be further reduced, and the vicious circle will soon lead to death.

The treatment must establish adequate ventilation. In some patients a mere increase in the concentration of oxygen inhaled will not suffice, because it may reduce the ventilation and aggravate the hypercapnia and acidosis. This phenomenon, which has been much discussed (Richards and Barach 1932, Donald 1949, Comroe et al. 1950, Bickerman and Beck 1952, Henriksen 1953), is caused as follows :

The sensitiveness of the respiratory centre to increased $p CO_2$ is reduced in such patients. The anoxæmia, which influences the respiratory centre via the chemoreceptors in the aortic arch and the carotid gland, thus becomes of increasing importance to the activity of the centre. When anoxæmia is prevented by the administration of oxygen in a high concentration, the activity of the respiratory centre will be much impaired, because its most important stimulus has been removed.

If oxygen treatment of such patients aggravates the hypercapnia, artificial ventilation should be instituted. At the same time an attempt should be made to improve the function of the lungs by other means—e.g., by antibiotic treatment of any infections, aspiration of secretion from the trachea and the bronchi, or physicotherapeutic exercise of the lungs to promote the expectoration. During the acute stage one may attempt to improve the ventilation by manual or mechanical ventilation.

* Abridged from a paper which appeared in Danish in *Ugeskrift for Laeger*, 1955, **117**, 247. Published by permission of the Editor, Prof. Mogens Fog.

A few reports of treatment with artificial ventilation according to these principles, often with excellent effect, have been published (Boutourline-Young and Whittenberger 1951, Chermiak 1953, Segal and Dulfano 1953, Stone et al. 1953, Lovejoy et al. 1954).

The Investigations

Methods

The oxygen saturation of the blood was determined by Brinckmann's reflectometric method (Zijlstra 1951), and p CO_2 was calculated from Henderson-Hasselbalch's equation on the basis of determination of pH and total content of carbon dioxide in the plasma. The electrocardiographic signs of cor pulmonale were right axis-deviation and large P_2 and P_3. Where the clinical condition allowed, the function of the lungs was assessed from determinations of the vital capacity and the maximum breathing capacity.

In three patients the pulmonary function was investigated in greater detail. The ventilation at rest, the total capacity and its fractions, and the oxygen consumption were measured, and a Tiffeneau test was performed.

The artificial ventilation was given with a tank respirator (Dräger and Emerson), and the manual ventilation was effected through an endotracheal tube with a to-and-fro system with or without an absorber. The tracheal or tracheobronchial toilet was performed by aspiration through a tube introduced into the trachea or through a bronchoscope. Physicotherapeutic exercise of the lungs was given by a specially trained physicotherapist, usually two or three times daily for several weeks. Oxygen was given in an oxygen tent or through a nasal catheter. All the patients were treated with antibiotics, usually penicillin G 4 million units daily.

Series of Patients

The patients were six men with chronic bronchitis and emphysema admitted to the medical department of Blegdamshospitalet between October, 1953, and September, 1954. All of them had experienced an acute aggravation of their illness and were extremely ill, almost moribund, when treatment was started. Clinical and laboratory findings are given in table I.

Treatment

In most cases the procedure in the acute situation was as follows. Oral intubation with introduction of a tube into the trachea was performed at once. Aspiration from the trachea and the bronchi was effected with a Tiemann catheter introduced through the tube. Oxygen treatment was then instituted while the patient was closely observed. If the condition was aggravated, with sluggishness and a rise in p CO_2 in the arterial blood, artificial ventilation was instituted, in some cases first in the tank respirator and, if this was ineffective, then as manual ventilation through the tracheal tube. Supplementary treatment was administered in the form of antibiotics, physicotherapeutic exercise of the lungs, and repeated tracheobronchial toilet. Some patients were fed through a stomach-tube. The artificial ventilation was discontinued when the patient's breathing had become sufficiently effective, estimated clinically and by analysis of arterial blood. When ventilation was required for more than 48 hours, its administration through a tracheotomy tube after tracheotomy was considered. This was done in one case.

TABLE I—CLINICAL AND LABORATORY FINDINGS AT ADMISSION IN 6 PATIENTS WITH CHRONIC BRONCHITIS AND RESPIRATORY ACIDOSIS

Case no.	1	2	3	4	5	6
Age (yr.)	67	56	53	61	61	51
Duration of bronchitis (yr.)	10	Several	50	5	36	32
Depressant drugs given before admission	−	+	−	−	−	+
Oxygen saturation of arterial blood	77	53	39	50	51	31
pH of arterial blood	7·36	7·12	7·24	7·29	7·33	7·20
p CO_2 of arterial blood	60	90	76	73	66	78
Hæmoglobin (%)	111	64	82	121	118	100
Erythrocytes (million per c.mm.)	5·3	4·08	4·29	5·59	5·79	4·91
Hæmatocrit (%)	50·9	34·6	..	54·2	59	47·8
Purulent sputum and pyrexia	+	+	+	−	+	−
Infiltration of lungs (radiography)	−	+	−	−	+	−
Right axis-deviation, large P_2 and P_3	−	+	+	+	−	+
Congestive heart-failure	+	+	−	+	+	−

Results

Treatment and results are shown in table II. Two of the patients were treated with a tank respirator alone; one died. Two were first treated with a tank respirator and, that being ineffective, with manual ventilation; one of these patients died. The fact that the tank respirator was ineffective in these two cases may be due in one case to bronchial intubation with much reduced ventilation of the left lung, and in the other to the inability of the patient to follow the rhythm of the respirator. Finally, two patients, who were much exhausted during the acute stage, were treated only by manual ventilation; they are both alive.

TABLE II—TREATMENT AND COURSE OF ILLNESS OF 6 PATIENTS WITH CHRONIC BRONCHITIS AND RESPIRATORY ACIDOSIS

Case no.	1	2	3	4	5	6
Tank respirator used	−	+	+	+	+	−
Manual ventilation through endotracheal tube used	+	+	−	+	−	+
Tank respirator effective	..	−	+	−	+	..
Manual ventilation effective	+	+	..	+	..	+
Complications	S	B.I.	B.I. Asp.	S	..	−
Died in hospital	..	..	+	+	..	..
Condition on discharge	Improved	Improved	..	..	Improved	Improved

Asp., aspiration. B.I., bronchial intubation. S, shock.

The effect of the artificial ventilation appeared sooner with manual ventilation than when a tank respirator was used.

Complications

Intubation of the right main bronchus with resulting insufficient ventilation of the left lung occurred twice. In both cases the error was soon discovered and corrected. *Vomiting* with *aspiration* occurred in case 3 during treatment with a tank respirator. Severe *shock* was observed in case 4 and moderate shock in case 1.

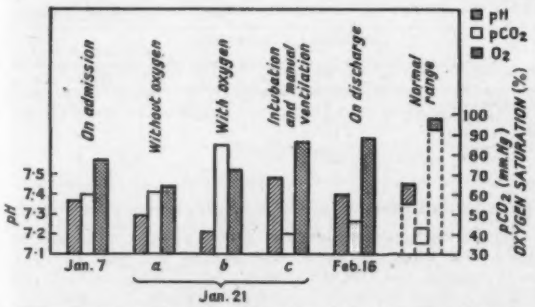
Illustrative Case-report

Case 1.—A former workman, aged 67, who had had bronchitis, expectoration, and increasing dyspnœa on exertion for about 10 years, was admitted with an acute exacerbation.

On admission he had pronounced cyanosis and dyspnœa; temperature 38°C (100·4°F); blood-pressure 130/70 mm. Hg; pulse-rate 68.

Investigations.—Radiography of the thorax showed sequelæ of left-sided pneumonia and slight increase in width of the heart. Electrocardiography showed left bundle-branch block. The arterial blood showed normal pH, increased p CO_2, and low oxygen saturation (see figure).

Course and treatment.—The patient was treated for about a week with oxygen and procaine penicillin, but he became worse, his arterial blood showing decreased pH, increased p CO_2, and improved oxygen saturation (see Jan. 21a and b in figure). He gradulaly became deeply comatose. A cuffed tube was therefore introduced into his trachea, and manual positive-pressure ventilation was instituted after the intravenous injection of tubocurarine 9 mg. Large quantities of mucopus were aspirated from the bronchi. In about an hour the pH, p CO_2, and oxygen saturation of the arterial blood



Case 1: arterial carbon-dioxide tension, pH, and oxygen saturation on admission, during treatment with oxygen, with intubation and manual ventilation, and on discharge. Note aggravation during oxygen inhalation and improvement during manual ventilation.

had become normal (see Jan. 21c in figure), in 8 hours the patient was completely conscious, and after 22 hours' manual respiration the tube was removed. Respiration was effected with nitrogen monoxide-oxygen 50%, 4 litres flow without absorber. Repeated falls of the blood-pressure during ventilation were counteracted by repeated injections of *l*-phenylephrine and blood-transfusion.

The patient was treated with oxygen for another two weeks. Antibiotic treatment of the bronchial infection was instituted with procaine penicillin, chlortetracycline (aureomycin), and sulphadiazine. After five weeks in hospital he was discharged with satisfactory pH, p CO_2, and oxygen saturation (see figure).

Follow-up.—He was out of bed with moderate dyspnœa on exertion when seen 5 months after discharge. Pulmonary-function tests then showed vital capacity 1·9 litres (56% of normal), total capacity 3·5 litres, residual air 1·6 litres, and maximal breathing capacity 18% of normal. Other tests indicated emphysema with pronounced obstructive pulmonary insufficiency.

Readmission.—A year later the patient was readmitted. His condition had been tolerably well up till a month previously, when he had an exacerbation of his bronchitis and an acute sinusitis. Under oxytetracycline (terramycin) therapy he improved, and on discharge his condition was almost the same as the year before. Treatment with sodium penicillin had to be cancelled owing to a severe allergic reaction.

Discussion

Four out of six patients were discharged improved. The favourable course in these four cases can no doubt be ascribed to the fact that the reduced pulmonary function was due to either acute infection or acute impairment of the respiratory centre following the administration of depressant drugs.

The question arises whether these results can be improved. Possibly the aspiration of vomit with fatal consequences in case 3 might have been avoided by prophylactic evacuation of the stomach and controlled administration of fluids; this was done in all the cases treated later. The chief cause of the severe shock in case 4 may have been prolonged anoxæmia during the 12-hour experiment with tank-respirator treatment; the tank respirator should undoubtedly be superseded by manual ventilation when it causes difficulties.

We wish to emphasise that several different methods of treatment were used simultaneously in these cases. It may often be difficult to decide which form of treatment is the best. However, we do not doubt that artificial ventilation is one of the most essential causes of survival of some of these patients.

Some may question the advantage for these patients of bringing them through the critical phases of an illness which cannot itself be appreciably influenced. The fact is, however, that in most cases it is impossible in the acute stage to know how the patient's condition has been previously and how good it may be in the future.

Summary and Conclusion

Six patients with chronic bronchitis and emphysema were treated, during a phase of uncompensated respiratory acidosis, by artificial ventilation supplemented by antibiotic treatment, physicotherapeutic exercise of the lungs, and tracheobronchial toilet. Two patients were treated with a tank respirator only, two first with a tank respiratory and then by manual ventilation, and two with manual ventilation only. One patient of each of the two first groups died; four patients were discharged improved.

Thus by active therapy patients with chronic bronchitis and emphysema can be brought through phases of severe respiratory acidosis which must otherwise be fatal. Both manual ventilation and tank respirator may be used, but the former seems to be the safer method.

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REFERENCES

Bickerman, H. A., Beck, G. J. (1952) *Ann. intern. Med.* **36**, 607.
Boutourline-Young, H. J., Whittenberger, J. L. (1951) *J. clin. Invest.* **30**, 838.
Chermiak, R. M. (1953) *Ibid*, **32**, 1192.
Comroe, J. H., Bahnson, E. R., Coates, E. O. jun. (1950) *J. Amer. med. Ass.* **143**, 1044.
Donald, K. (1949) *Lancet*, ii, 1056.
Henriksen, E. (1953) *Ugeskr. Laeg.* **115**, 496.
Lassen, H. C. A. (1953) *Lancet*, i, 37.
Lovejoy, F. W. jun., Yu, P. N. G., Nye, R. E. jun., Joos, H. A., Simpson, J. H. (1954) *Amer. J. Med.* **16**, 4.
Richards, D. W. jun., Barach, A. L. (1932) *Amer. Rev. Tuberc.* **26**, 253.
Segal, M. S., Dulfano, M. J. (1953) Chronic Pulmonary Emphysema. New York; p. 132.
Stone, D. J., Schwartz, A., Newman, W., Feltman, J. A., Lovelock, F. J. (1953) *Amer. J. Med.* **14**, 14.
Zijlstra, W. G. (1951) Fundamentals and Applications of Clinical Oximetry. Dissertation: N.v. Assen, Holland.

6-MERCAPTOPURINE IN ACUTE LEUKÆMIA

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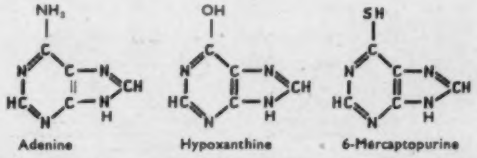
SYNTHETIC analogues of naturally occurring purines and pyrimidines might be expected to act as metabolic antagonists in the early stages of nucleic acid synthesis in the body by entering into the existing enzyme systems in place of the nucleotide precursor they resemble, and thus blocking further synthesis.

Many such substances have been prepared by G. H. Hitchings and associates in an extensive series of researches begun in 1942, and clinical trials have been made in various malignant proliferative diseases in the search for an agent which would influence the metabolism of neoplastic cells selectively without causing severe damage to normal cells. The most effective of this group of analogues at present appears to be 6-mercaptopurine, synthesised by Elion et al. (1952). The structure of this compound is closely related to that of adenine and hypoxanthine:



Studies of the metabolism of nucleic acid in *Lactobacillus casei* and other micro-organisms have shown that 6-mercaptopurine acts as a metabolic antagonist of adenine and hypoxanthine. Presumably the mode of action in mammalian tumours is similar, although

neither the chemotherapeutic nor the toxic effects can be reversed by administering purine. In laboratory animals the toxic effects are chiefly on cells of the bone-marrow and other hæmopoietic tissues and the gastro-intestinal tract, although hepatic degeneration may follow very high dosage (Philips et al. 1953, Clarke et al. 1953).

Clinical trials of 6-mercaptopurine, during the last three years, in acute and chronic leukæmias, malignant reticulo-endothelial disorders, and metastasising neoplasms of various kinds have suggested that this anti-metabolite may be of considerable value in acute leukæmia and perhaps in chronic granulocytic leukæmia, although it appears to be substantially ineffective in most other malignant conditions (Burchenal et al. 1953, Hall et al. 1954, Fountain 1955). The potentialities of 6-mercaptopurine are of particular interest because reports suggest that it may prove more effective than other agents in the treatment of acute monocytic leukæmia and acute leukæmias in adults.

The present report is based on a study of 15 adults with acute leukæmia who have been treated with 6-mercaptopurine in the last two years.

Classification of Cases and Assessment of Remission

Cases have been classified on a cytological basis into myeloblastic, lymphoblastic, and acute monocytic types, with the aid of Romanowsky, Sudan-black, Feulgen, and peroxidase staining methods and phase-contrast microscopy. Most cases in this series did not present great difficulty in cell identification: 4 were lymphoblastic, 6 myeloblastic, and 5 acute monocytic.

Remissions were assessed as complete when clinical signs and symptoms of the disease disappeared and the peripheral-blood and bone-marrow pictures returned essentially to normal, with less than 10% of primitive cells and lymphocytes in the marrow aspirate. When substantial improvement in clinical manifestations took place, accompanied by a return in blood and marrow cytology towards normal but with obvious leukæmic features persisting, the remissions were classed as partial.

TABLE II—EFFECT OF 6-MERCAPTOPURINE IN ACUTE LEUKÆMIA

No. of cases treated		No. of remissions	Complete or nearly complete remissions
Myeloblastic ..	6	2	1
Lymphoblastic ..	4	2	1
Monoblastic	5	3	..
Total	15	7	2

Dosage and Control of 6-Mercaptopurine Treatment

The 6-mercaptopurine was given usually in a single daily oral dose, at an initial rate of 2·5 mg. per kg. body-weight, as recommended by Burchenal et al. (1953). Most patients therefore received 120–200 mg. daily during the early stages of treatment. Dosage was maintained at this level until suppression of leukæmic proliferation became manifest by a fall in the peripheral leucocyte-count and by a reduction in the proportion of primitive cells in the blood and bone-marrow, or, in unresponsive patients, until an adequate therapeutic trial had been continued for three weeks.

When evidence of response was obtained, intermittent therapy or maintained treatment at a lower dosage was administered until definite leucopenia was produced. When a complete remission was achieved by this means, 6-mercaptopurine was discontinued and was not resumed until relapse threatened. In patients whose remission was only partial, frequent intermittent courses of treatment were given in an attempt to prevent recrudescence. Antibiotics were not used routinely but only when there were signs of infection, and blood-transfusions were avoided during treatment with 6-mercaptopurine unless rendered essential because of severe anæmia.

Gastro-intestinal toxic effects of the kind described by Hall et al. (1954) were not observed in most of the present patients, perhaps because the dosage did not exceed 2·5 mg. per kg. body-weight daily, but in 2 cases anorexia, nausea, and vomiting were unpleasantly severe.

In every case treatment was started in hospital, with frequent hæmatological examinations, but patients were allowed home as soon as possible and closely followed

TABLE I—DETAILS OF CASES

Case no.	Sex	Age (yr.)	Type of acute leukæmia	Previous treatment and remissions	Dosage of 6-mercaptopurine (mg. per kg. body-weight)	Degree and duration of remission	Survival-time from onset of disease (months)
1	M	55	Myeloblastic	None	2·5 daily for 8 days, 2 in intermittent maintenance courses	Almost complete, 3 months	6
2	M	45	Myeloblastic	Transfusion and cortisone without effect	2·5 daily for 3 weeks	None	4
3	M	38	Myeloblastic	Transfusion and cortisone without effect	2·5 daily for 2 weeks	None	3
4	F	19	Myeloblastic	Transfusion ineffective	2·5 daily for 3 weeks	Partial, 1 month	8 (including 5 in full remission on cortisone)
5	F	44	Myeloblastic	Transfusion and cortisone without effect	2·5 daily for 16 days	None	3
6	F	52	Myeloblastic	None	2·5 daily for 3 days (death occurred before adequate trial of treatment)	None	1
7	F	61	Lymphoblastic	None	2·5 daily for 10 days	None (leucocytes reduced but no clinical improvement)	4
8	M	17	Lymphoblastic	None	2·5 for 5 days, further 8-day course after relapse	Partial, 2 weeks	3
9	F	37	Lymphoblastic	Transfusion and cortisone, complete remission 6 mos.	2·5 for 10 days	None no effect	14
10	M	33	Lymphoblastic	Cortisone without effect	2·5 for 10 days, 2 for 7 days after 5 months' remission	Complete, 8 months +	Living and well 11 after onset and 8 after start of remission
11	F	60	Monoblastic	Transfusion ineffective	2·5 daily for 5 days	None	3
12	F	52	Monoblastic	Transfusion, partial remission for 3 weeks	2·5 daily for 7 days, intermittent maintenance	Partial, 2 months	8
13	F	43	Monoblastic	None	2·5 daily for 21 days, intermittent maintenance, excessive nausea and vomiting after 5 months' intermittent therapy	Partial, 5 months	Living but in relapse 8 after onset
14	F	35	Monoblastic	Transfusion ineffective	2·5 daily for 11 days	Partial, 2 months	4
15	M	21	Monoblastic	Transfusion ineffective	2·5 daily for 8 days	None	3

at weekly or fortnightly visits to the outpatient department.

Results of Treatment

Brief details of all 15 patients are given in table I, and the frequency of remissions in the different cytological varieties of acute leukæmia is analysed in table II.

Discussion

Although the results of treatment with 6-mercaptopurine in children with acute leukæmia are probably no better than those achieved with folic-acid antagonists (Burchenal et al. 1953), the drug has clearly an important place in the management of acute leukæmia in adults. Hall et al. (1954) treated with 6-mercaptopurine 24 adults with acute leukæmia and obtained 10 partial and 3 complete remissions. The initial remission-rate was higher and the duration of remissions longer in patients with acute lymphocytic leukæmia than in those with either myeloblastic or monoblastic leukæmia, but successes were obtained in all cytological types of acute leukæmia.

Fountain (1955) treated 7 adults with 6-mercaptopurine and obtained 3 complete remissions, 1 in each of the three major varieties of acute leukæmia; 1 further patient showed a partial response, and 3 proved refractory to treatment.

Burchenal et al. (1953) recorded the results of treatment of 12 adults, among whom 1 experienced a complete, and 3 others a partial, remission. One of the partial remissions was in a patient with monoblastic leukæmia, and the other remissions were all in those with myeloblastic leukæmia.

The results achieved in the present series confirm the capacity of 6-mercaptopurine to produce remissions in all cytological kinds of acute leukæmia in adults; and 6-mercaptopurine is now probably the chemotherapeutic agent of choice in monoblastic and myeloblastic leukæmias in such patients. In lymphoblastic leukæmia, whether in children or in adults, corticotrophin and cortisone have not been displaced as the primary agents of choice, but 6-mercaptopurine provides a valuable second agent for use in acute leukæmia resistant to these hormones.

Summary

15 adults with acute leukæmia were treated with 6-mercaptopurine.

7 patients experienced remission—partial in 5 and complete in 2.

The complete remissions occurred in patients with myeloblastic and lymphoblastic leukæmia and lasted respectively three months and more than eight months.

The partial remissions were obtained in 1 patient with myeloblastic, 1 with lymphoblastic, and 3 with monoblastic leukæmia.

6-Mercaptopurine is at present probably the agent of choice in myeloblastic and monoblastic leukæmias of adults.

I wish to thank Sir Lionel Whitby for his constant advice, and the physicians of Addenbrooke's Hospital for their helpful coöperation. Initial supplies of 6-mercaptopurine were provided through the kindness of the medical directors of Burroughs Wellcome in New York and London.

REFERENCES

Burchenal, J. H., Murphy, M. L., Ellison, R. R., Sykes, M. P., Tan, T. C., Leone, L. A., Karnofsky, D. A., Craver, L. F., Dargeon, H. W., Rhoads, C. P. (1953) *Blood*, **8**, 965.

Clarke, D. A., Philips, F. S., Sternberg, S. S., Stock, C. C., Elion, G. B., Hitchings, G. H. (1953) *Cancer Res.* **13**, 593.

Elion, G. B., Burgi, E., Hitchings, G. H. (1952) *J. Amer. chem. Soc.* **74**, 411.

Fountain, J. R. (1955) *Brit. med. J.* **1**, 1119.

Hall, B. H., Richards, M. D., Willet, F. M., Feichtmeir, T. V. (1954) *Ann. N.Y. Acad. Sci.* **60**, 374.

Philips, F. S., Sternberg, S. S., Clarke, D. A., Hitchings, G. H. (1953) *Proc. Amer. Ass. Cancer Res.* **1**, 42.

PNEUMATOSIS CYSTOIDES INTESTINALIS

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INTESTINAL pneumatosis is a rare condition characterised by the presence of cystic lesions varying from 1 mm. to 2 cm. or more in diameter, containing gas, mainly nitrogen, and having a lining of flattened or cubical cells of doubtful origin. They occur either in the subserosa or submucosa or in both situations.

Koss (1952), reviewing 213 cases collected almost entirely from mid-European and American sources, found only 13 in which the colon was involved and none in which the rectum was involved. Matthews (1954) was the first to report seeing such cysts on sigmoidoscopy—at 23 cm. from the anus.

Though now the characteristic X-ray appearances are more generally recognised, pneumatosis has only very rarely been diagnosed before operation.

No completely satisfactory theory to account for the lesions has yet been suggested. The most generally accepted view, resulting mainly from the work of Wright (1930), is that intestinal gas is forced into lymphatic channels, having gained entry through a break in the mucosa, such as a duodenal ulcer. This is supported by the fact that pneumatosis is often associated with peptic ulcers, especially in cases affecting the small bowel, and it is a striking feature that in a large percentage of the published cases the abdomen was opened because of disease of either the stomach or the duodenum, usually ulcer, the cysts being found incidentally. A case reported by Somerville (1951) illustrates many of these points very well.

There is some evidence that intestinal pneumatosis is self-limiting, and that the cysts may disappear spontaneously.

The following case illustrates some of these points.

Case-report

A woman, aged 43, was first seen in January, 1949, complaining of passing blood and mucus in her stools several times a day. She also had attacks of abdominal pain, mostly in the left iliac fossa. Her symptoms began in October, 1947, but did not become troublesome until the autumn of 1948. In 1946, a year before the onset of these symptoms, she had her abdomen opened for hysterectomy, and apparently nothing unusual was observed in the bowel at the time. There had been no history of gastric trouble.

On admission abdominal examination showed a fullness down the left side of the abdomen but no definite mass. Sigmoidoscopy showed a large number of bullous lesions of different sizes bulging into the lumen of the rectum and

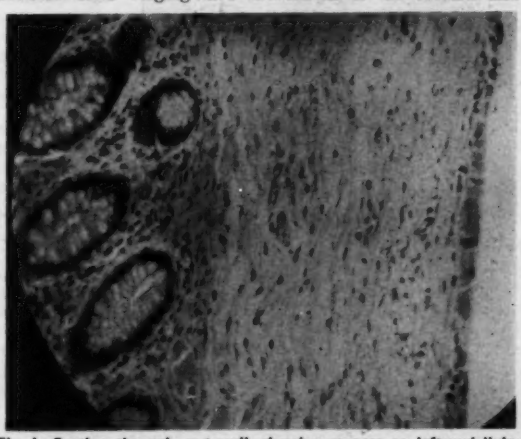

Fig. 1—Section through cyst wall, showing mucosa on left and lining cells of cyst on right.

sigmoid as far as the instrument would reach. These were clear thin-walled dome-shaped protuberances. The intervening mucosa appeared quite normal. Biopsy (fig. 1) and radiography showed the typical findings and appearances of pneumatosis. The symptoms not being very severe, it was decided to keep the patient under observation, but she left the district.

Fig. 2—Barium enema, showing the typical serrated appearance and round defects in filling.

Re-examination.—She did not come again until January, 1954, when her symptoms had changed somewhat, her complaint now being mainly of troublesome constipation and more severe abdominal pain. Abdominal examination showed a more definite sausage-shaped swelling down the left side of the abdomen, and sigmoidoscopy revealed a considerable increase in the number of cysts, beginning at a point about 17 cm. from the anus, though the rectum appeared little worse than on the previous occasion. It was impossible to pass the sigmoidoscope beyond this point; the cysts were clearly now sufficiently numerous to narrow the lumen. A barium enema showed that the area involved was the distal part of the transverse and the whole of the descending colon (fig. 2).

Course.—By March, 1954, symptoms of obstruction were becoming more definite, and it was decided to excise the involved bowel.

Operation.—When the abdomen was opened, the left colon immediately sprang to view; it looked like a continuous mass of cysts, 0·5–2·0 cm. in diameter (fig. 3), and felt like sponge rubber. There were scattered cysts in the proximal transverse colon, but the very thickly involved and obstructed area consisted of the distal third of the transverse and the descending colon as far as a point about 5 cm. above the peritoneal reflection. At this point there was a sudden reduction in the number of cysts. This involved piece of bowel was excised and an end-to-end anastomosis was made. No other abnormality was found in the abdomen, no cysts being seen in any other part of the intestine. Recovery was uneventful.

Fig. 3—A portion of the mucosal surface of the resected bowel. (Photograph by Dr. David Lewes.)

Follow-up.—Sigmoidoscopy three weeks after the operation showed no cysts, those previously seen in the rectum having apparently disappeared. Further examination a month later was equally negative. The patient was last seen in February, 1955, feeling well and having no symptoms. Sigmoidoscopy again showed no abnormality to 25 cm. from the anus. A barium enema, however, showed that a few cysts were still present in the transverse colon.

Conclusions

The progress of this case, which has been observed for six years, supports the view that intestinal pneumatosis tends to be self-limiting, the cysts disappearing spontaneously.

The present case is exceptional in that the cysts were found in the colon and the rectum, and in the fact that the disorder was diagnosed by sigmoidoscopy and radiography.

My sincere thanks are due to Dr. J. C. Valentine for advice and help in pathology and photography.

REFERENCES

Koss, L. G. (1952) *Arch. Path.* **53**, 523.
Matthews, F. J. C. (1954) *Brit. med. J.* i, 851.
Somerville, P. (1951) *Lancet*, ii, 1160.
Wright, A. W. (1930) *Amer. J. Path.* **6**, 87.

THE IN-VITRO EFFECT, OF METHYLTHIOURACIL AND ŒSTRADIOL MONOPHOSPHATE ON THE CONVERSION OF THYROXINE TO TRIIODOTHYRONINE BY KIDNEY SLICES

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Gross and Pitt-Rivers (1952a and b) and Roche et al. (1952) have shown that a new organic compound, 3:5:3′-triiodothyronine, is found in the thyroid, blood, and apparently other tissues. They have also demonstrated that it has a very powerful biological activity. Gross and Leblond (1951) and Gross and Pitt-Rivers (1952b) suggest that triiodothyronine is formed from thyroxine by deiodination in the extrathyroidal tissues and is probably the active compound.

Albright et al. (1954) have proved that the conversion of thyroxine to triiodothyronine by deiodination takes place in kidney tissue in vitro. They observed that chromatically pure *l*-thyroxine labelled with ^{131}I is partially transformed into triiodothyronine after incubation with slices of kidney surviving in physiological media.

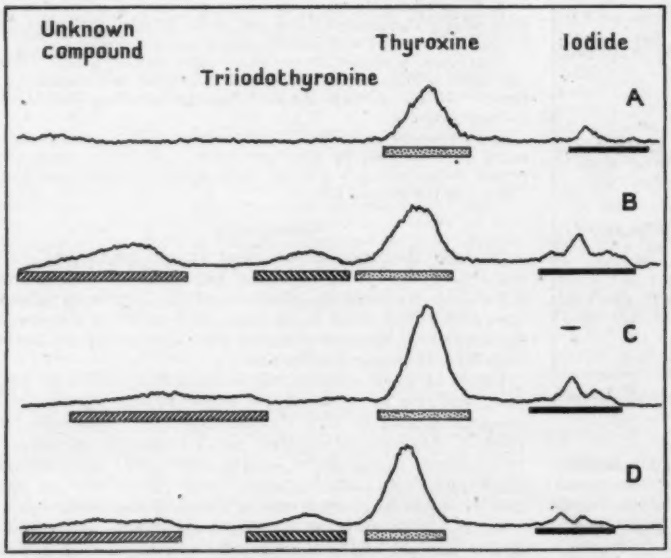
We used Albright's method to investigate directly the effect of methylthiouracil *—a synthetic anti-thyroid substance—on the conversion of thyroxine to triiodothyronine in kidney tissue. Furthermore, since it was suggested by some clinical (Engstrom and Markardt 1954) and experimental (Sherwood 1941, Guidry et al. 1952) observations that there is an antagonism in tissues between thyroxine and œstrogens, we studied by the same method the effect of œstradiol monophosphate on the extrathyroidal deiodination of thyroxine.

Methods

The incubation and extraction of the iodised compound with butanol was done by exactly the same procedure as that used by Albright et al. (1954). The butanol extracts were analysed by paper chromatography (Lissitzky 1952). Radioactivity was then registered directly on the chromatogram with a rate-meter fixed to the Geiger-Müller counter (Lerch and Neukomm 1954).

In a first series of experiments, slices of a rat's half-kidney, to which was added 0·05 μg. of chromatically pure thyroxine † labelled with ^{131}I, were incubated. The

* 'Thiomidil' (Wander).
† Abbott Laboratories.



Chromatograms of butanol extracts of homogenised kidney slices after incubation with thyroxine labelled with ^{131}I.

A, before incubation.
B, after 4 hours' incubation.
C, after 4 hours' incubation + addition of methylthiouracil to the medium.
D, after 4 hours' incubation + addition of œstradiol monophosphate.

specific radioactivity was 25 μC per μg. In a second series the dose of thyroxine was 0·03 μg. with a specific radioactivity of 70 μC per μg. The periods of incubation were 4 and 8 hours respectively.

Methylthiouracil 15 μg. dissolved in an alkaline medium was added to the preparation before incubation. We made sure that the solvent had no inherent action of its own. The dose of œstradiol monophosphate was 2 μg. in each preparation.

The controls—those with methylthiouracil as well as those with œstradiol monophosphate—were prepared simultaneously and incubated in exactly the same conditions.

Results

After incubation of the thyroxine with kidney slices, for 4 and 8 hours, the butanol extracts regularly contained triiodothyronine (see figure). In each case the addition of methylthiouracil obviously inhibited the conversion of thyroxine to triiodothyronine. On the other hand, œstradiol monophosphate had no effect on this phenomenon.

Discussion

The results agree completely with those obtained by Albright et al. (1954) and confirm that triiodothyronine may be formed in the extrathyroidal tissues by the deiodination of thyroxine.

The fact that methylthiouracil inhibits the deiodination of thyroxine shows that methylthiouracil has a double impact—on the dehalogenation of thyroxine as well as on its synthesis.

These results confirm absolutely those reported by Maclagan et al. (1952), Wilkinson and Maclagan (1953), and Wilkinson et al. (1954), who showed that a synthetic anti-thyroid substance — n-butyl-3:5-diiodo-4-hydroxybenzoate—increased the biological effect of triiodothyronine in mice and inhibited that of thyroxine. This substance reduced the urinary secretion of inorganic iodine in the rat treated with triiodothyronine as well as in the rat treated with thyroxine. These observations suggest that n-butyl-3:5-diiodo-4-hydroxybenzoate affects the deiodination of these two organic iodised compounds, and that triiodothyronine is the biologically active one.

Œstradiol monophosphate had no obvious action on the extrathyroidal deiodination of thyroxine. Perhaps it acts differently, or the doses were not large enough.

A rapidly migrating iodised compound usually appears on the chromatograms. This compound has not yet been identified. It is probably the result of a binding of iodine with a lipoid carrier (Vannotti et al. 1955). We called it the " yellow spot."

Summary and Conclusions

Chromatographically pure thyroxine labelled with ^{131}I was incubated with kidney slices in a physiological medium. After incubation for 4 and 8 hours butanol extracts of the homogenised kidney slices were chromatographically analysed and always found to contain radioactive triiodothyronine. Therefore, under these experimental conditions, thyroxine is converted to triiodothyronine by deiodination.

The addition of methylthiouracil inhibited this conversion of thyroxine to triiodothyronine, whereas œstradiol monophosphate had no effect on it.

These experiments show that the anti-thyroid action of methylthiouracil is due not only to the inhibition of the synthesis of thyroxine in the thyroid gland, but also to the inhibition of the conversion of thyroxine to triiodothyronine in other tissues.

REFERENCES

Albright, E. C., Larson, F. C., Tust, R. H. (1954) *Proc. Soc. exp. Biol., N.Y.* **86**, 137.
Engstrom, W. W., Markardt, B. (1954) *J. clin. Endocrin.* **14**, 215.
Gross, J., Leblond, C. P. (1951) *Proc. Soc. exp. Biol., N.Y.* **76**, 686.
— Pitt-Rivers, R. (1952a) *Lancet*, i, 439.
— — (1952b) *Ibid*, p. 593.
Guidry, M. A., Segaloff, A., Altschul, A. M. (1952) *Endocrinology*, **50**, 29.
Lerch, P., Neukomm, S. (1954) *Schweiz. med. Wschr.* **84**, 515.
Lissitzky, S. F. (1952) Biochimie des acides aminés iodés marqués par I^{131} dans le corps thyroïde. Doctorate thesis, Paris.
Maclagan, N. F., Sprott, W. E., Wilkinson, J. H. (1952) *Lancet*, ii, 915.
Roche, J., Lissitzky, S., Michel, R. (1952) *C.R. Acad. Sci., Paris*, **234**, 1228.
Sherwood, T. C. (1941) *Endocrinology*, **29**, 215.
Vannotti, A., Cruchaud, S., Frei, J., Mahaim, C. (1955) *Bull. Acad. suisse Sci. méd.* **11**, 28.
Wilkinson, J. H., Maclagan, N. F. (1953) *Lancet*, ii, 1024.
— Sprott, W. E., Bowden, C. H., Maclagan, N. F. (1954) *Biochem. J.* **56**, 215.

COMA AND ELECTRO-ENCEPHALOGRAPHIC CHANGES IN HYPOPITUITARISM

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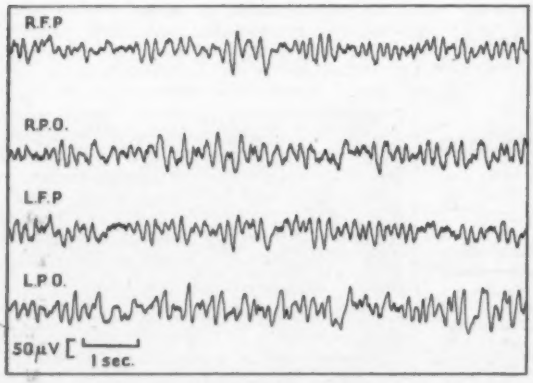
IN Simmonds's syndrome of hypopituitarism attacks of coma are not rare, but some patients escape them completely.

The fact that patients with this condition often have either a low blood-sugar level or an abnormal sensitivity to insulin suggested that their occasional attacks of



Electro-encephalogram of a woman, aged 49, who had had repeated attacks of coma over three years.

coma might be due to hypoglycæmia, but it soon became clear that this was not the invariable cause when some patients did not recover consciousness after intravenous injections of glucose had raised their blood-sugar level well above normal.

Subsequently Sheehan and Summers (1952) noticed that an extremely low body-temperature was sometimes associated with an attack of coma, and that correction of the hypothermia by the simple application of heat might restore consciousness rapidly.

Finally, in a few cases of coma a widespread disturbance of the electrolytes of the blood has been found which was conceivably responsible for the condition.

It therefore seems that, either singly or in combination, hypoglycæmia and hypothermia may certainly precipitate coma in hypopituitarism, and, less convincingly, that other disturbances of the blood chemistry may play a similar part.

On the other hand, we have observed in hypopituitarism prolonged coma in which neither hypoglycæmia nor hypothermia was present and the blood chemistry was normal. In a recent case the concentration of electrolytes in the muscles and the blood was also within the range of that found in 20 healthy people (J. A. Litchfield, personal communication) save for a moderate rise in the blood-urea level.

Investigation

In view of the possible relationship between the pituitary gland and nervous structures, we thought that it would be interesting to study electro-encephalograms in Simmonds's syndrome to see if there were any evidence of hypothalamic or other nervous disturbance, despite the generally accepted statement that the electro-encephalogram is normal in hypopituitarism in the absence of a space-occupying lesions. For this purpose we collected 7 patients in all of whom the diagnosis had been completely established by clinical and laboratory investigation.

Results

In 2 male patients who had never had periods of coma we obtained normal electro-encephalograms.

2 other patients with normal tracings had had a single isolated period of unconsciousness only, three years or more before electro-encephalography. In 1 of them the coma coincided with the onset of cortisone treatment; in the other the coma lasted only half an hour and the nature of the attack remains in doubt.

3 patients who had had repeated attacks of coma gave abnormal electro-encephalograms:

A. B. persistently gave an abnormal tracing at all times, with widely distributed theta and delta activity which would be quite consistent with hypothalamic dysfunction.

C. D. gave a record of the same type while "giddy" but not unconscious, though on other occasions her record has been "within normal limits" though showing very-low-voltage activity.

E. F. showed generalised high-voltage delta waves during coma accompanied by hypoglycæmia. At other times her record shows very-low-voltage theta activity which is almost "flat" in the frontal leads.

Comments

Though the number of cases is too small and the variability too great to draw any definite conclusion, a liability to coma in disorder of the pituitary gland apparently does tend to be associated with an abnormal electro-encephalogram of such a kind as is not inconsistent with hypothalamic dysfunction.

Cases of fully established Simmonds's syndrome are rare, and we have found no other reports on electro-encephalograms in this disease save the statement by Piaggio Bianco (1950) that in 2 cases of secondary myxœdema of pituitary origin there was generalised theta and delta activity over the whole head; so the matter seems to us to merit further investigation.

We thank Dr. S. R. F. Whittaker for placing case-records at our disposal and obtaining some electro-encephalograms for us.

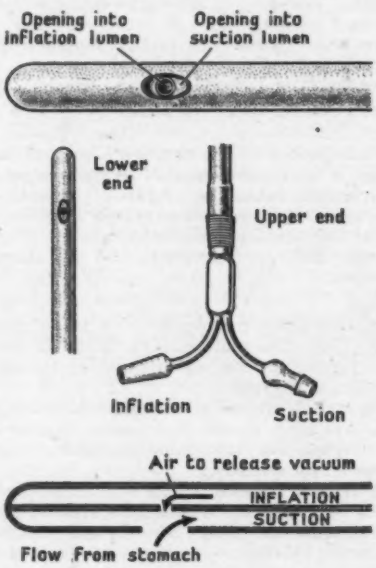
REFERENCES

Piaggio Bianco, R. A. (1950) *Arch. urug. Med.* **37**, 167.
Sheehan, H. L., Summers, V. K. (1952) *Brit. med. J.* **i**, 1314.

New Inventions

A GASTRIC ASPIRATION-TUBE

CONTINUOUS gastric aspiration has become one of the most important adjuncts to abdominal surgery; because of its great value it has produced a great deal of extra work for the nurses. The difficulties in the use of an



ordinary single-lumen tube of the Ryle type are as follows:

(1) When the stomach has become empty by aspiration, the inlet holes in the tube are liable to blockage by mucosa, since the vacuum is still being produced. This applies to any

method of continuous suction, whether by inverted bottles, water suction-pump, or electric suction-pump, and causes much extra work for the nurses.

(2) If suction continues in the presence of mucosal blockage, the gastric mucosa may be ulcerated, as has often been found at necropsy.

(3) The tube may become blocked by blood-clot or particles of food.

In the drainage of other areas of the body the sump type of drain allows continuous successful aspiration of exudate. This principle has been used in the design of a gastric aspiration-tube which largely overcomes the first and second above-mentioned difficulties.

The new tube (see figure) has a double lumen. At the upper end is a metal attachment allowing independent access to each lumen. One side is marked SUCTION, and the other INFLATION. At the lower end of the tube the suction lumen opens into the stomach. At the same level the inflation lumen opens into the suction lumen, opposite the opening into the stomach.

The method of use is to pass the tube via nose or mouth into the stomach. A suction apparatus is attached to the suction side, the inflation side being left open to the air. When gastric contents cover the lower end of the tube they will be sucked up in the usual way. When the stomach becomes empty, air will be sucked from the inflation lumen, thus breaking any vacuum between mucosa and the suction side of the tube. As fluid accumulates in the stomach, a combination of air and fluid will be sucked up. It is imperative that the suction be of low power—say, the equivalent of 3 ft. of water. Alternatively, suction being developed slowly by a small-capacity pump such as the 'Minivac' (Thackray Ltd.) is suitable. High-powered suction defeats the object of the tube since the rate of air inflow down the inflation tube is insufficient in those circumstances to break the vacuum fully.

If the tube is blocked by blood-clot or by particles of food, forcible entry of water down the inflation side will help to clear the block, and the same method can be used on the suction side. If water has been used down the inflation side it should be cleared by a small injection of air. To prevent obstruction of the tube by blood-clot after gastrectomy the tube is passed before operation, and aspiration is started as soon as any blood is liable to be present in the stomach. This prevents the blood from clotting before it can be aspirated.

Once the nurses have become accustomed to the use of this tube, their work is greatly reduced.

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Ballochmyle Hospital, Mauchline, Ayrshire.

GAVIN CLELAND
M.B.E., F.R.C.S.E.

A VEIN STRIPPER WITH DETACHABLE HEADS

MOST strippers in use today consist of a single or coiled wire with, at one end, a fine knob or introducer and, at the other, a larger knob against which the vein is stripped. The stripper is either introduced into the vein at the groin and passed from above downwards, or introduced below at the ankle and passed upwards. It is often more difficult to pass the stripper down the whole length of the saphenous vein because it tends to enter branches or be held up at a tortuosity. If the stripper is introduced from below it usually passes without trouble to the groin, because many of the tributaries approach the saphenous vein from the same direction as the main venous flow, and the stripper therefore does not enter them.

Once the stripper has been introduced, however, it is easier to strip the vein from above downwards than from below upwards. This is partly because the vein is more solid at the groin and is less liable to tear, and partly because there is less loose areolar tissue between the vein and the skin in the leg than in the thigh, and therefore the stripping is often more difficult to start in the leg, especially if there is or has been associated ulceration.

Sometimes one cannot pass the stripper either up or down the full length of the vein from either end, owing to bunches of tortuous veins in the middle thirds of the calf and thigh.

These difficulties can be largely overcome if the stripper has detachable heads, enabling either end to be introduced into a vein and a head to be attached at whichever end is convenient, thus allowing the stripper to be passed from below upwards and the vein to be stripped from above downwards.

The stripper so designed consists of a coiled wire with a single wire core having an introducer at both ends. The introducer is made of a sleeve with a bevelled expansion near its tip (fig. 1). The head is composed of two parts, a slotted flange and a cap which screw together. When the introducer emerges from the vein it is passed through the slot of the flange and then pulled down so that its bevelled surface engages with a similar face on the flange (fig. 2). The head is then united by screwing down the cap (fig. 3).

Fig. 1

Fig. 2.

Fig. 3.

This stripper has proved of value in the function for which it was designed. It has an additional advantage that, where varicosities in the middle thirds of the leg and thigh present a difficulty, the stripper can be introduced into the long saphenous vein at the knee, one end being passed upwards to the groin, and the other downwards to the ankle. The heads are then attached, and both segments of the vein are stripped towards the knee.

We are grateful to Sir Cecil Wakeley for his interest and encouragement, and we wish to thank Mr. S. T. Smith, of the physicist's department of King's College Hospital, for his help and skill in the making of this instrument.

F. T. GRAVES
F.R.C.S.

P. W. BLOWER
M.B. Lond.

King's College Hospital, London

Reviews of Books

Corneal Grafts

B. W. RYCROFT, O.B.E., M.D., D.O.M.S., F.R.C.S., ophthalmic surgeon, corneoplastic unit, Queen Victoria Hospital, East Grinstead. London: Butterworth. 1955. Pp. 285. 57*s*. 6*d*.

THIS is the first book of its kind in the English language, and is worthy of its author, who has done so much to further corneal grafting in this country.

The text is a series of monographs by experts from various parts of the Western world. They deal with all aspects of corneal grafting, not only surgical, but biological, legal, and histopathological, and each in his own sphere gives a clear account of his subject. But in a volume such as this there are bound to be gaps, and some important new methods, such as the scientific measurement of corneal thickness, receive only brief mention. But there are beautifully illustrated, detailed accounts of all well-recognised techniques, and no-one reading these pages can be in doubt about the steps of each operation. Since there is no unanimity about the best method of fixing a corneal graft in position, various methods are described and some comparative results given.

The first question asked by a patient is likely to be about the chance of losing the eye as a result of this operation. But the answer to this question is not easily found in the text and the reader is left with the fact that in penetrating grafts about 5% of eyes are "made worse." More detailed statistics must be forthcoming before this question can be answered.

Mr. Rycroft's book can be recommended to all ophthalmologists engaged in this work. They will find in it practical advice from surgeons of many parts of the world.

La progénèse

Facteurs préconceptionelles de développment de l'enfant. Editor: RAYMOND TURPIN, professor, Faculty of Medicine, Paris. Paris: Masson. 1955. Pp. 703. Fr. 3500.

"PROGÉNÈSE" is a word coined by Professor Turpin to cover all the factors which may influence a child's development, even before conception. This book is a report of the addresses at a course he directed at the International Children's Centre in Paris in 1954. Its range is very wide. Man's place in Nature, human heredity, existing eugenic legislation and the prospects of eugenics in the future, the effects of malnutrition and toxins on the human germ cells, and the treatment of infertility are all included. Moral aspects, too, as they appear in a Catholic country, are discussed by a Jesuit who is also a scientist. There is little original material, but as a synopsis of recent, particularly continental, work on pre-conceptional influences it is very useful. A chapter on the heredity of disorders of the nervous system by L. van Bogaert is outstanding because of the author's knowledge of pathology, and a stimulating contribution from J. B. S. Haldane on the biochemical action of genes visualises a time when young couples will exchange information on the recessive mutations they each carry before they become engaged.

The Surgery of Theodoric

Volume I, Books I and II. Translated by ELDRIDGE CAMPBELL, M.D., and JAMES COLTON, M.A. Issued under the auspices of the New York Academy of Medicine. New York: Appleton-Century-Crofts Inc. 1955. Pp. 223. $5.50.

Theodoric's *Chirugia*, written in 1267, is of interest to the modern surgeon not only for its content, but also for the picture it gives of medieval surgical thought and practice. Theodoric was possibly the actual son, and certainly the professional and spiritual son, of Hugo of Lucca. His writings record the surgical principles and practices of the father. Often he elaborated them, after having tested them in his own practice.

Much of the text is astonishingly wise. The resources of medicine are said to be three: diet, drugs, and surgery, the last to be used only when the others are inapplicable. He points out that the word "chirurgia" comes from two greek words meaning "action with the hand." He recommends that "practitioners of surgery frequent the places where skilled surgeons operate, to attend their operations diligently and to commit them to memory." He urges them not "to be rash or daring," but to "operate under all circumstances with what gentleness they can, especially around cerebral membranes, sensitive parts and other ticklish places." Dealing with wounds he writes "above all else a wound must be made clean." He appreciated the need of leaving a wound dry, and often he speaks about boiling the wine or other substances to be used on wounds before their application. He states that the wound so prepared should not be drained but should be closed either by sutures or by bandages and bolsters applied to each side of it and then it should not be disturbed for four to six days. This is strictly modern surgery, although written nearly seven hundred years ago.

The present volume is a translation of the first two books of Theodoric. It deals with wounds, dislocations, fractures, and hæmorrhage. The remainder of his work is to be published in a second volume. Surgeons, orthopædic surgeons, and anyone interested in the history of medicine will find this book very interesting. Undoubtedly Theodoric was one of the great surgeons.

Morals and Medicine

JOSEPH FLETCHER, professor of pastoral theology and christian ethics, Episcopal Theological School, Cambridge, Mass. London: Gollancz. 1955. Pp. 243. 15*s*.

IN this book an American theologian discusses "the moral problems of the patient's right to know; contraception; artificial insemination; sterilisation and euthanasia."

For Professor Fletcher the chief end of man is to develop to its fullest stature that highest part of him, his personality; and this is to be done by exercising his power of choice. New knowledge has widened man's control of his own fate; more facts are available concerning diseases from which he may suffer and their likely outcome; he is freer than he was to decide whether to have children, and "finally by euthanasia we are able to control our being or not being." (Have we not, in fact, rather lost the power to die at will?) "We human beings," he affirms, "increase in wisdom and stature"; and it is time we took advantage of new knowledge and techniques, chose freely and so developed further. He therefore finds euthanasia and control of fertility—positive and negative—to be morally right. Not only has the patient the right "to know" if he wants to, but also "when the patient is too ignorant to ask for the information acquired by the doctor it is clearly the doctor's moral obligation to supply it." If the patient wishes *not* to know, the doctor "should respect his wishes."

It is easier to admit the logical cogency of the author's reasoning than to accept his premises as valid, or his conclusions as expedient. A liberal-minded doctor may agree with Ecclesiastes that "to everything there is a season," but also with St. Paul that though all things were made lawful for him not all would be expedient. Towards the end of the book Professor Fletcher hints at eugenic and compulsory extensions of sterilisation and even of euthanasia: he quotes with approval the dictum that "there should be no child in America that has not the complete *birthright* of a sound mind in a sound body," and "wholly and passionately rejects" the view that "to exist with a taint is better than not to exist at all." He manages to dismiss the terrifying example of the Third Reich in a couple of sentences.

Recent Advances in Radiology (3rd ed. London: J. & A. Churchill. 1955. Pp. 358. 45*s*.).—In this edition, Dr. Thomas Lodge has broadly followed the presentation of the previous one, and he covers some of the literature of the past twenty years. In his preface, he says that he has written for the radiologist working in a general hospital and not for the specialist in any one field. This has been a difficult task and inevitably many readers will consider that particular subjects have been inadequately dealt with and that important work has been neglected. But within the limits of a book of this size Dr. Lodge has attained his main object. The work reflects his personal views throughout, as well as those of the Sheffield school.

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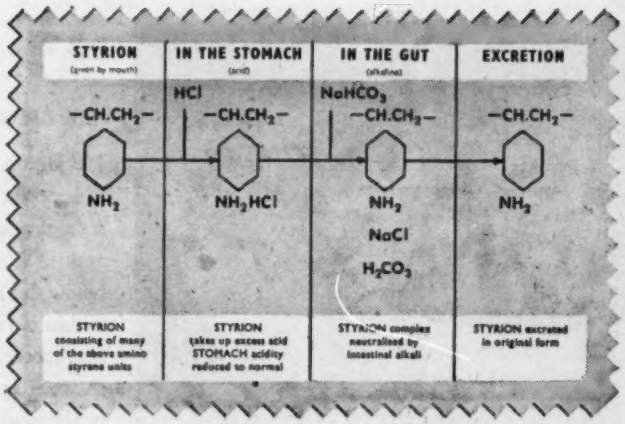

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THE LANCET
LONDON: SATURDAY, OCT. 29, 1955

Gastro-enteritis in Infants

IN 1922 ADAM [1] published his first paper on dyspepsiekoli, a group of *Escherichia coli* which he believed gave rise to infantile gastro-enteritis. His differentiation was based on biochemical reactions, and few workers followed up his findings. Twenty-three years later BRAY [2] suggested that a specific *serological* type of *Esch. coli* was responsible for an epidemic of infantile gastro-enteritis. Very soon other workers had confirmed and extended BRAY's findings [3–5]; and in the course of this work many further types of *Esch. coli* which cause enteritis in babies were identified. If new admissions to a babies' unit can be kept in a separate part of the hospital until they are known not to be excreting any of these specific serological types of *Esch. coli*, outbreaks of enteritis can be largely avoided. But this system will fail when an infant is the carrier of an unidentified new type; and many workers now hold that if an epidemic cannot be traced to any recognised organism the affected babies and their contacts should be investigated for the presence of a new type of *Esch. coli*.

In England many hospital bacteriologists have reason to be grateful for the help that is so readily and quickly given by the reference laboratories of the Public Health Laboratory Service in investigating these outbreaks. In the U.S.A. there is obviously the same close liaison between clinicians and laboratory workers. Last year STULBERG and his colleagues [6] in Michigan described an epidemic in a premature-baby unit due to *Esch. coli* type 0·111 (B 4). The same group of workers [7] have now reported another epidemic made up of six connected series of cases spread over a period of four months; of 60 affected babies 5 died. In the six preceding months there had been several sporadic cases of diarrhœa in the unit, and although no ætiological agent could be identified, strains of *Esch. coli* from each ill baby were saved. In the actual epidemic each epidemic wave subsided when neomycin was administered to the affected babies, but fresh waves of cases continued to arise until the neomycin was given to all the infants in the unit. Routine bacteriological investigations did not reveal the presence of salmonellæ or shigellæ, and because of the uniform colonial appearance of the *Esch. coli* it seemed obvious that a specific serological type of this organism was the pathogen. Later, EWING et al.[8] identified as type 0·127 (B 8) the *Esch. coli* isolated both from the earlier sporadic cases and in the epidemic. In this outbreak it was found that the longer a baby had been in hospital the greater was the risk that it would become infected —a feature well demonstrated in Glasgow by ANDERSON and his co-workers.[9]

Controlled trials showed that the attack-rate of gastro-enteritis in carriers of type-specific *Esch. coli* was reduced by prophylactic administration of chloramphenicol or sulphadiazine.[10] American workers have shown that in treatment neomycin is valuable.[6 7 11] STULBERG found that administration of neomycin had reduced the attack-rate of gastro-enteritis in the carriers; and he depended on bacteriological screening and chemoprophylaxis with neomycin to prevent the other infants in the premature-baby unit from becoming infected by *Esch. coli* type 0·127. Despite neomycin therapy the mortality was 8%, and there was a very high bacteriological and relatively high clinical relapse-rate. The schemes described in England [12 13] were unlike this since they combined bacteriological screening with *segregation* of the excreters. STULBERG's practice apparently reduced the morbidity; but it was more than four months before the nursery was free of the *Esch. coli* type 0·127.

The view that type-specific *Esch. coli* cause most of the epidemics of infantile gastro-enteritis in institutions is based mainly on epidemiological investigations and feeding experiments. Direct proof from pathological findings has been lacking; the post-mortem appearances are not in any way distinctive, septicæmia is extremely rare, and antibody production is difficult to demonstrate by ordinary routine methods, which show irregular or no rise in titre. NETER [14] has evolved a method of demonstrating hæmagglutinins which promises to provide more informative results. THOMSON [15] has attempted to provide direct proof of the pathogenicity of these organisms by a careful quantitative bacteriological study of duodenal juice aspirated during life and of post-mortem material from affected babies. This important work lends great weight to earlier qualitative findings.[16] THOMSON found that the specific serological types of *Esch. coli* were present in very large numbers from the duodenum to the rectum, and in the bile. (Ascent of bacteria into the upper small intestine has also been demonstrated in cases of sprue.[17]) Culture of the vomit of babies with enteritis due to *Esch. coli* often yields a pure growth of the specific organism, and ROGERS [18] found that these vomiting babies can be dangerous to nearby infants.

Thus direct evidence is confirming the pathogenicity of specific serological types of *Esch. coli*, and neomycin is proving useful and reliable in treatment. But there is still no generally accepted way of handling an epidemic. In Britain many children's hospitals have had relatively few cases of this form of enteritis in the present year; so perhaps now is the time to plan for speedy localisation of any epidemic. STULBERG's experience reinforces a suggestion by ROGERS [19] that, if there is an epidemic in a babies'

1. Adam, A. *Jb. Kinderheilk.* 1922, **99**, 86.
2. Bray, J. *J. Path. Bact.* 1945, **57**, 239.
3. Giles, C., Sangster, G. *J. Hyg., Camb.* 1948, **46**, 1.
4. Taylor, J., Powell, B. W., Wright, J. *Brit. med. J.* 1949, **ii**, 117.
5. Smith, J. *J. Hyg., Camb.* 1949, **47**, 221.
6. Stulberg, C. S., Zuelzer, W. W., Nolke, A. C. *Pediatrics*, 1954, **14**, 133.
7. Stulberg, C. S., Zuelzer, W. W., Nolke, A. C., Thompson, A. L. *Amer. J. Dis. Child.* 1955, **90**, 125.
8. Ewing, W. H., Tanner, K. E., Tatum, H. W. *Publ. Hlth Rep., Wash.* 1955, **70**, 107.
9. Anderson, T., Crockatt, H., Ross, C. A. C. *J. Path. Bact.* 1954, **68**, 1.
10. Todd, R. McC., Hall, E. G. *Brit. med. J.* 1953, **i**, 1359.
11. Wheeler, W. E., Wainerman, B. *Pediatrics*, 1951, **14**, 357.
12. Jameson, J. E., Mann, T. P., Rothfield, N. J. *Lancet*, 1954, **ii**, 459.
13. *Brit. med. J.* 1953, **ii**, 219.
14. Neter, E., Bertram, L. F., Arbesman, C. E. *Proc. Soc. exp. Biol., N.Y.* 1952, **79**, 255. Neter, E., Zalewski, N. J., Fergusson, W. W. *Ibid*, 1953, **82**, 215.
15. Thomson, S. *J. Hyg., Camb.* 1955, **53**, 357.
16. Taylor, J., Charter, R. E. *J. Path. Bact.* 1952, **64**, 715.
17. Frazer, A. C. *Brit. med. J.* 1949, **ii**, 731.
18. Rogers, K. B. *Proc. R. Soc. Med.* 1951, **44**, 519.
19. Rogers, K. B. *Med. ill.* 1954, **8**, 239.

ward or maternity unit, admissions to the ward should be stopped, and the ward emptied of patients and fumigated before being reopened. This may seem a drastic course, but half-measures usually result in the establishment of an endemic infection in the unit [20]: no antibiotic has been discovered which can be used for chemoprophylaxis without subsequent bacteriological relapses. In the larger cities hospitals might arrange to help each other if an epidemic became very extensive.

Poliomyelitis Problems

THIS year poliomyelitis has been much in everyone's thoughts. It is now established that some batches of poliomyelitis vaccine used in the U.S.A. last spring contained live poliomyelitis virus.[21] It is also clear from the technical report by the United States Public Health Service [22] that the manufacturing laboratories, including the laboratory whose vaccine was found to contain live virus, had conformed with detailed directives which they had been given. Study of the manufacturers' experience shows that when in preparing vaccine they treated the virus with formaldehyde, this often did not result in satisfactory inactivation; so certain lots of vaccine had to be discarded. Thus inactivation by formaldehyde is not so certain as SALK [23] has supposed, and stricter criteria of virus inactivation are now being applied. The important question whether, in satisfying the new criteria of safety, the antigenicity of the vaccine will be retained has been exhaustively discussed, and time will show whether a formula can be devised for preparing a formaldehyde-inactivated vaccine which will combine safety with antigenicity at least as good as that already described.[24]

The incidence of poliomyelitis in this country has been high this summer. One interesting feature has been the rather high proportion of non-paralytic cases —for example, in the Willesden area—and this has aroused doubts whether some of the cases could be due to another virus. Dr. McMATH, the superintendent of Neasden Hospital, whose letter we publish on p. 924, does not feel that there is any reason to suspect a different ætiology. Dr. BREEN (p. 923) finds that the proportion of non-paralytic to paralytic poliomyelitis in the South Middlesex Hospital is very much lower than that in Neasden Hospital. This difference is unlikely to be due entirely to differences in reporting; and it is more probable that differences in poliomyelitis-virus type or virulence are responsible. In Lowestoft an outbreak of an infectious illness occurred which Dr. A. C. GEE, the medical officer of health, believes was not poliomyelitis.[25] Infected children had neck rigidity, fairly high fever, and vomiting; they recovered fully, usually within a week. This may have been an outbreak of non-paralytic poliomyelitis due to a virus of low virulence, or it may have been caused by an unrelated virus; laboratory investigations will be necessary to decide this point. Laboratory investigations will be needed, too, to establish the cause of the outbreak this summer at the Royal Free Hospital. The clinical picture [26] was reminiscent of that in outbreaks of poliomyelitis-like infections in Iceland [27] and later in this country,[28] from which no causal virus has yet been recovered.[27–29]

There have been many recent improvements in laboratory techniques for isolating and identifying viruses, and there is a natural desire to investigate outbreaks of poliomyelitis and related infections as fully as possible. In his letter Dr. BREEN suggests that the facilities for routine virus investigations are deficient. This is a particularly difficult problem. Developments in the production of poliomyelitis vaccines will inevitably strain our resources in virologists and technicians; many will be needed to prepare poliomyelitis vaccine commercially, and to supervise the elaborate safety tests; and if poliomyelitis vaccines are tested in this country there will be further demands on man-power for assessing their efficacy. Inevitably these needs will be met first, and investigations of outbreaks of poliomyelitis or poliomyelitis-like infections will suffer. Dr. BREEN's plea for further "routine" virus laboratories is well justified; but the need can be met only by augmenting our small band of virologists; and this will take time.

Second Thoughts on Glucagon

GLUCAGON—the hyperglycæmic-glycogenolytic factor (H.G.F.) of the pancreas—raises the blood-sugar in man and animals by stimulating glycogenolysis in the liver.[30–32] So much has been proved. But the additional hypotheses that it is derived from the α-cells of the pancreas,[33] and is a hormone which acts as a "powerful insulin antagonist," [34] are being challenged.

GOLDNER et al.[35] were able to extract glucagon from the pancreas of dogs treated with alloxan to destroy the β-cells and with cobalt to destroy the α-cells, and they now report [36] repetition of these experiments in dogs whose pancreatic ducts had been ligated three to five months before the treatment by alloxan and cobalt. These animals showed considerable acinar fibrosis; and, though extracts of their pancreas still had hyperglycæmic activity, this was reduced in degree. The investigators therefore raise the question whether the hyperglycæmic factor does not come from the excretory parenchyma of the pancreas. Glucagon can also be extracted from the gastric mucosa and the duodenum.[37]

The experiments of VAN ITALLIE et al.[38] suggest that glucagon does not inhibit the peripheral utilisation of glucose, and therefore cannot be regarded as in any essential sense an antagonist of insulin. By a study of the glucose levels in capillary and vein after an infusion of glucagon they demonstrated that the blood-sugar values in the falling limb of the curve were appreciably lower in venous than in capillary

20. Singer, E. *Med. J. Aust.* 1954, ii, 129.
21. Peterson, L. J., Benson, W. W. *J. Amer. med. Ass.* 1955, **159**, 241.
22. See *Publ. Hlth Rep., Wash.* 1955, **70**, 738.
23. Salk, J. E. *J. Amer. med. Ass.* 1955, **158**, 1239.
24. See *Lancet*, 1955, i, 851.
25. *Ibid*, Oct. 8, 1955, p. 777.
26. *Ibid*, Aug. 13, 1955, p. 351.
27. Sigurdsson, B., Sigurjonsson, J., Thorbelsson, J., Gudmunsson, K. R. *Amer. J. Hyg.* 1950, **52**, 222.
28. *Lancet*, 1954, ii, 1060.
29. Pellew, R. A. A., Miles, J. A. R. *Med. J. Aust.* 1955, ii, 480.
30. Sutherland, E. W., Cori, C. F. *J. biol. Chem.* 1951, **188**, 531.
31. Myers, J. D., Kibler, R. F., Taylor, W. J. *Fed. Proc.* 1952, **11**, 111.
32. Kirtley, W. R., Waife, S. O., Helmer, O. M., Peck, F. B. *Diabetes*, 1953, **2**, 345.
33. Vuylsteke, C. A., Cornelis, G., de Duve, C. *Arch. int. Physiol.* 1952, **61**, 273.
34. de Duve, C. *Lancet*, 1953, ii, 99.
35. Goldner, M. G., Volk, B. W., Lazarus, S. S. *J. clin. Endocrin.* 1954, **14**, 184.
36. Lazarus, S. S., Volk, B. W., Goldner, M. G. *Metabolism*, 1954, **3**, 449.
37. Sutherland, E. W., de Duve, C. *J. biol. Chem.* 1948, **175**, 663.
38. Van Itallie, T. B., Morgan, M. C., Dotti, L. B. *J. clin. Endocrin.* 1955, **15**, 28.

blood, and from this observation they conclude that glucagon does not interfere with the peripheral uptake of glucose. The same conclusion may be drawn from the experiments of HUBBLE,[39] who found that the fall of the blood-sugar curve in 17 diabetics after an injection of glucagon closely paralleled the fall seen in the glucose-tolerance test of these same diabetics. In 3 thyrotoxic diabetics, on the other hand, the blood-sugar fall was faster after glucagon hyperglycæmia than after alimentary hyperglycæmia. VOLK et al.[40] report a diminished insulin sensitivity in hyperthyroid dogs, which they attribute to the rapid breakdown of hepatic glycogen in the hyperthyroid state—a breakdown faster than the uptake (also rapid) of glucose at the periphery. The distinction between glucagon hyperglycæmia and alimentary hyperglycæmia which HUBBLE observed in thyrotoxic diabetics could thus be explained by glucagon having emptied the liver of its glycogen, leaving little to be mobilised later by thyroxine. VAN ITALLIE et al.[38] and HUBBLE [39] examined the effect on the blood-sugar of glucagon given with an intramuscular injection of adrenaline. The blood-sugar curves were considerably higher than when glucagon alone was injected—from which HUBBLE infers that glucagon does not inhibit the glycogenolytic effect of adrenaline on muscle, whereas VAN ITTALIE and his colleagues conclude that adrenaline inhibits peripheral glucose uptake. This conclusion they support by showing that the capillary-venous differences in the blood-sugar were almost removed by the action of adrenaline.

Glucagon then is not an insulin-antagonist; its site of origin is still undetermined; and its hormonal status is uncertain. Indeed, if it is a hormone it probably acts synergistically with insulin, by making hepatic glycogen available for insulin action at the periphery.[41 42] ANDERSON [43] has reviewed the experimental evidence which suggests that glucagon not only potentiates the action of insulin, but also stimulates its production during the postabsorptive period.

If the place of glucagon in human physiology is still unsettled, its use in pathological diagnosis requires critical examination. KIRTLEY et al.[35] used glucagon in 8 diabetics, and on the shape of the consequent blood-sugar curves they divided these diabetics into two groups. 4 who were young and thin, in whom the diabetes was labile and ketotic, showed a small rise and a rapid fall; while 4 elderly, obese, and non-ketotic diabetics showed a higher rise and a slow fall. By the response to glucagon, the well-known insulin-sensitive and insulin-insensitive types could thus be differentiated. But HUBBLE, having repeated this work and compared the results with the Himsworth insulin-glucose-tolerance test, the insulin-tolerance test, the glucose-tolerance test, and the patient's clinical type, does not believe that any such differentiation is possible by the injection of glucagon. Several of his elderly and obese diabetics showed only a small rise (less than 25%) over the fasting blood-sugar, while in one child diabetic the response of the blood-sugar to glucagon was increased from 18 to 53% by giving a meal and insulin before the test was made.

WINSTON EVANS, LITTLER, and PEMBERTON [44] have lately described 4 uncontrolled young diabetics with large livers in which an excess of glycogen was found. In 3 of them, after an infusion of glucagon the blood-sugar rose only by 85, 20, and 35 mg. per 100 ml.—a result attributed by the investigators to impaired glycogenolysis. One may assume that the height of the fasting blood-sugar must have some influence on the capacity of the liver to mobilise glycogen, and in these cases the fasting blood-sugars were 425, 420, and 450 mg. per 100 ml. It would have been valuable to have repeated the glucagon test after insulin, as in the child whose case is quoted above. Moreover, it has already been demonstrated that in such uncontrolled cases, with glycogen-filled livers, an injection of adrenaline provokes a normal glycogenolytic response.[45] Adrenaline (provided it is not used in an impotent solution [46 47]) remains both a more powerful and a more accessible glycogenolytic agent than glucagon.

39. Hubble, D. *Diabetes*, 1955, **4**, 197.
40. Volk, B. W., Lazarus, S. S., Lew, H. *Metabolism*, 1955, **4**, 10.
41. Pincus, I. J., Rutman, J. Z. *Arch. intern. Med.* 1953, **92**, 666.
42. MacCrath, W. B., Snedecor, J. G. *Diabetes*, 1953, **2**, 443.
43. Anderson, G. *Science*, 1955, **122**, 457.
44. Evans, R. W., Littler, T. R., Pemberton, H. S. *J. clin. Path.* 1955, **8**, 10.
45. Houet, R. *Pr. méd.* 1949, **12**, 159.
46. Crawford, T. *Quart. J. Med.* 1946, **15**, 285.
47. Hubble, D. *Lancet*, 1954, i. 235
48. Heyck, von H., Hess, R. *Schweiz. Med. Wschr.* 1955, **85**, 573.

Annotations

NOBEL PRIZE IN MEDICINE

THE award of the Nobel prize in physiology and medicine to Prof. Hugo Theorell of the Nobel Institute, Stockholm, represents the second occasion on which this honour has been given to a compatriot of the founder.

Professor Theorell's fundamental contribution to the study of cell respiration was made in the early 'thirties, when he isolated the "yellow respiratory enzyme" in crystalline form. Other contemporaries—notably Otto Warburg, another Nobel prizeman—helped to define the chemical nature of this enzyme; but to Theorell goes the credit for showing that the enzyme could be reversibly split into two inactive portions—namely, a prosthetic group (riboflavine phosphate) and a protein carrier. This enzyme is now known as the "old yellow enzyme" to distinguish it from other yellow respiratory ferments that have since been discovered.

Of late years Professor Theorell has added notably to our knowledge of oxidase enzymes of the cytochrome type. These enzymes are also associated with cell respiration and act in conjunction with the flavine enzymes.

VASOMOTOR HEADACHE AND EPILEPSY

THE borderlands of epilepsy constitute a perpetual diagnostic problem. At what stage, for instance, should we term "epileptic" the patient who repeatedly has sudden brief loss of consciousness, often with pallor and perhaps occasionally a little minor twitching, and whose attacks appear quite causeless? In such cases considerable reliance has been placed on electro-encephalography, which occasionally gives an unequivocal answer. But as our knowledge of the range of normal has increased the number of records regarded as decisive has been reduced, and we have been left increasingly to make a clinical decision.

Heyck and Hess,[48] working in Prof. H. Krayenbühl's clinic in Zürich, seek to extend this borderland a little. They find that of 200 patients with severe episodic vasomotor headache 20 showed evidence of epileptic dysrhythmia in their electro-encephalograms, particularly after photic stimulation; and of 48 patients with classical

migraine 8 showed such evidence. Their patients tended to faint easily, and be subject to unusual emotional instability. The possibly "epileptic" nature of their symptoms seemed to be confirmed by their improvement with anticonvulsant drugs. Yet we should be wary of extending the meaning of epilepsy—if only because of its social and psychological implications for the layman. It seems more reasonable to regard the cerebral changes in vasomotor headache as one of many factors which may produce either electro-encephalographic abnormality or brief loss of consciousness in a patient whose cerebral make-up contains an "epileptic tendency" (we have little direct knowledge of what this is), rather than to bring vasomotor headaches within the fold of larval epilepsy.

BONE BIOPSY

IT is generally agreed that histological diagnosis should usually precede treatment of a bone tumour, whether by surgery or by radiotherapy. This necessity arises from the increasing knowledge of the histopathology of bone tumours [1]—in particular the extent to which their histological subdivision aids prediction of clinical behaviour—and from the unreliability of other methods of distinguishing effectively between the various types of tumour and separating these from non-neoplastic lesions. Radiographic findings, though important, are to some extent non-specific, and do not establish conclusively the nature of the lesion.

The necessary histological information can occasionally be obtained by localised surgical resection of the lesion, but biopsy is usually necessary before more radical surgery or radiotherapy. Hitherto, open biopsy has usually been practised. Its great advantage is that it yields almost always an adequate and representative sample of the lesion. Some consider that with this method there is little risk of promoting metastatic spread,[2 3] but certainly local extension of the tumour in the biopsy wound occasionally ensues. Such extension, and the biopsy incision itself, are serious disadvantages if radiotherapy is subsequently applied. Accordingly some workers have resorted to aspiration biopsy, by techniques developed not only for bones but also for other tissues and organs. These techniques [4] involve removal of tissue through a hollow needle, trephine, or drill, introduced through a small skin puncture which does not interfere with any subsequent radiotherapy; a general anæsthetic is not required. The chief disadvantage of this method is that it yields little tissue, and thus erroneous conclusions are sometimes reached—in as many as a third of the cases in some early series,[5 6] but in a considerably smaller proportion since experience of the method has increased.

The aspiration method was largely developed at the Memorial Hospital in New York.[7 8] It was soon applied to the diagnosis of bone tumours by Coley et al.[9]; and its value in this field was established in 1945 by Snyder and Coley.[5] Christiansen,[10] Ellis,[6] and van den Brenk [4] have used the rotating trephine ("drill biopsy") for bone, as well as for soft tissues. Ottolenghi [11] and Schajowicz [12] describe from Buenos Aires experience with aspiration biopsy of bone in a series of more than 1000 cases. By simple aspiration with a 2-mm. needle, positive diagnostic information was obtained in 84% of attempts. Lesions of all types, and in almost all parts of the skeleton, were studied, only the skull base and the bodies of the 1st to 10th thoracic vertebræ being inaccessible. Most of the lesions aspirated were in the vertebral bodies, femur, or pelvis. Metastatic carcinoma and various types of primary bone tumour were the diagnoses most often established, but various inflammatory and other non-neoplastic lesions were encountered. In this series diagnosis depended on paraffin sections prepared from the aspirated material, but smears were also made and were particularly useful in lesions of hæmopoietic tissues. The Buenos Aires workers emphasise that close collaboration between surgeon, radiologist, and pathologist is necessary for the effective use of aspiration biopsy for bone lesions.

Aspiration biopsy will no doubt be increasingly used in the diagnosis of bone lesions, particularly where conventional bone biopsy is difficult or inadvisable, either for anatomical reasons or because radiotherapy may be applied subsequently.

1. Lichtenstein, L. Bone Tumours. St. Louis, 1952.
2. Ackermann, L. V., del Regato, J. A. Cancer. St. Louis, 1947.
3. Cade, S. *Ann. R. Coll. Surg. Engl.* 1951, **9**, 11.
4. van den Brenk, H. A. S. *Aust. N.Z. J. Surg.* 1955, **24**, 217.
5. Snyder, R. E., Coley, B. L. *Surg. Gynec. Obstet.* 1945, **80**, 517.
6. Ellis, F. *Brit. J. Surg.* 1947, **34**, 240.
7. Martin, H. E., Ellis, E. B. *Ann. Surg.* 1930, **92**, 169.
8. Martin, H. E., Ellis, E. B. *Surg. Gynec. Obstet.* 1934, **59**, 578.
9. Coley, B. L., Sharp, G. S., Ellis, E. B. *Amer. J. Surg.* 1931, **13**, 215.
10. Christiansen, H. *Acta radiol. Stockh.* 1940, **21**, 349.
11. Ottolenghi, C. E. *J. Bone Jt Surg.* 1955, **37A**, 443.
12. Schajowicz, F. *Ibid*, p. 465.

COLOUR-BLINDNESS IN YOUNG PEOPLE

IT is nearly ten years since a committee of the Colour Group of the Physical Society, in a report on defective colour-vision in industry,[1] suggested that school-children should be tested for colour-vision. Betenson [2] has now described the results of ten years of such testing in Brecknock schools; so this seems a good moment to consider the problems once again.

About 8% of the male population have some defect of colour-vision; the colour-blind woman is comparatively rare. The most common forms of colour defect consist in difficulty in distinguishing differences between red, green, and yellow which are obvious to normal people. People with this defect are sometimes loosely called red-green blind; but their difficulty is not in *seeing* these colours (the relevant parts of the spectrum do not generally seem to them white or black) but in telling which is which. There is also a colour defect (tritanopia) in which blue, green, and yellow are similarly confused, and two forms of complete colour-blindness in which there is no appreciation of hue whatever; these last two are very rare.

Often boys with grossly defective colour-vision grow up unaware of their disability. Such ignorance is the cause of much disappointment and difficulty for some youths who have specialised in their later school years with a view to a career in, for instance, the Navy or R.A.F. or even medicine, and who discover that owing to deficient colour-vision their choice is unsuitable or impossible. It was on behalf of these unfortunates that the Colour-Group committee pleaded for tests in the early years at school.

This recommendation has been taken up by the Ministry of Education and is put forward in the chief medical officer's report for 1952–53 [3] with the hope that all education authorities will, in time, act on it. This report refers to four borough and two county authorities which are giving regular colour-vision tests to many of the children in their care. In general the Ishihara test is used alone, but in two districts this is supplemented by a lantern test for individual failures.

It seems therefore that the battle for general testing of boys below the age when their future is decided is on the way to being won. But of equal importance is standardisation of the tests. Without standardisation different examiners may get different results from the same individual; and this sometimes leads to uncertainty and hardship. Candidates for some careers are tested before being accepted for training; and then, because

1. Published by the Society, 1, Lowther Gardens, London, S.W.7.
2. Betenson, W. F. W. *Med. Offr*, 1955, **94**, 169.
3. The Health of the School Child: Report of the chief medical officer, Ministry of Education, 1952–53. H.M. Stationery Office, 1954.

of an idea that colour-vision can deteriorate between the ages of 16 and 20, they may have another test, often under totally different conditions, at the end of the training period. It is not unknown for candidates who have been accepted for training to be rejected later on the ground of colour deficiency. Since there is no good scientific evidence that colour-vision deteriorates in the late teens, these rejections cause resentment as well as disappointment.

The Ministry of Education recommends an Ishihara test supplemented where necessary (and where a dark room is available) by a lantern test; but the Ministry offers no guidance as to the best method of administering these tests. In the Ishihara book of charts the would-be examiner is told only that the cards should be kept out of the sun to prevent fading, and that the tests should not be applied in artificial light. In addition there is an introduction in which a diagnostic value is claimed for the test which, in fact, it does not possess. No suggestions are given as to the best method of scoring. If properly applied the Ishihara test will detect a handicapping colour defect affecting the red, green, and yellow parts of the spectrum. Contrary to the claim made in the introduction, this test does not reveal the exact type of deficiency within this group; and people with tritanopia can read all the charts correctly. Since the main practical object of colour-vision tests is to discover those who may be incompetent or even dangerous in occupations where the difference between red and green must be recognised, the Ishihara test is, in general, fairly satisfactory; but for any investigation of the various forms of defect a more detailed examination is essential. For those who are keen to know more of this subject, Wright gives a clear exposition in his excellent book.[4]

PROGRESS REPORT

IN his presidential address to the West London Medico-Chirurgical Society on Oct. 20, Mr. G. B. Woodd-Walker delved deep into the past and spared some words of wise advice and rather guarded hope for posterity.

In tracing the history of mankind he reserved his warmest admiration for man's first slow steps in conquering his environment; and indeed to make fire may well have been as difficult and as significant as to split the atom. Even half a century ago different peoples were at widely different stages of civilisation: the Stone Age, as Mr. Woodd-Walker pointed out, was running its undisturbed course in such places as New Guinea and Central Australia. But modern transport and modern means of communication have relentlessly brought the benefits and dangers of what we call civilisation to these pockets of older cultures. Whereas man acquired knowledge and mastery over his environment slowly and painfully, his knowledge and mastery is now being applied with almost terrifying speed; in Mr. Woodd-Walker's vivid phrase, the stone-axe head-hunter of yesterday may be today a uniformed policeman.

Now that we have solved so many of the problems which Nature has set us, the time has come, he suggested, to consider whether we can solve the problems which we have set ourselves. Have we, for instance, conquered disease only to be confounded by over-population? Have we conquered distance only to be defeated by the difficulties of living together? The varied life of the small communities has given way to the complex monotony of our vast agglomerations, and Mr. Woodd-Walker admitted that he found the uniformity of contemporary civilisation depressing. Of new suburbs he said:

"The few local shops have given way to branches of the dozen big retail stores. The grocer, the shoe-shop, and the rest, with their too familiar names and standard products, stand shoulder to shoulder in every new shopping-centre. And the new houses, whether council or private, display the same uniformity in their construction and the taste of their inmates."

Yet though so many of us lead similar lives, he fears that we are as far as ever from understanding how our neighbours feel and think—and today our neighbours live all over the globe. To improve the transmission of facts and of ideas is, in his view, the next urgent task that faces mankind. If we are to solve it in time we must be prepared, he suggested, to grasp new methods, to free ourselves from the limitation of language, and to use visual and photographic statements more boldly. Mr. Woodd-Walker believes that "thought can and should be transmitted graphically and pictorially with minimal use of words."

CORTICOTROPHIN AND CORTISONE IN THE NEPHROTIC SYNDROME

CORTICOTROPHIN and cortisone are now widely used in the treatment of the nephrotic syndrome, especially in the variety which Ellis[1] called "type-2 nephritis." The cause of this condition is unknown, and at the onset it does not have the serious complications of hypertension, hæmaturia, and nitrogen retention. As the syndrome is commonest in children,[2] more is known of the results of treatment in children than in adults. Heymann et al.[3] have recorded the results in a series of 64 children treated by repeated short courses, lasting from 10 to 12 days, of either cortisone or corticotrophin. Diuresis was obtained in 52 patients, usually during the actual administration of the drugs. Only 13 of the children received more than four separate courses of treatment, and the average length of remission was 4·2 months after corticotrophin and 2·6 months after cortisone. Of patients who eventually died of renal failure, there was diuresis in only a half and it became steadily less frequent as the condition deteriorated. Heymann and his colleagues conclude that hormone treatment has greatly reduced the morbidity of the disease, since œdema can usually be kept under control, but they consider that the eventual mortality-rate remains unaffected. 17 of the children have already died, and a fatal outcome is expected in another 6. This corresponds very closely with a similar series[4] reported in 1946 before cortisone and corticotrophin became available; and the results are much the same as those previously described[2 5–7] with cortisone and corticotrophin.

Because of the frequency of relapse after short courses of treatment, hormones are often continued after diuresis has started. Lange et al.[8] have given the results of longer periods of treatment lasting up to six or seven months. They gave corticotrophin or cortisone in large doses for three consecutive days of each week, to diminish toxic side-effects. Long remissions followed, and no relapse was noted while treatment continued. Proteinuria was much reduced and the plasma-protein pattern and raised blood-cholesterol returned to normal. Complications of treatment are not rare,[6] and they include intercurrent infection, hypertension, and hypokalæmia. Prophylactic penicillin and a low-sodium diet with potassium supplements were found to be of great value. No large series of adults treated with corticotrophin or cortisone has been published, but it is generally agreed that the outlook is more unfavourable than in children.

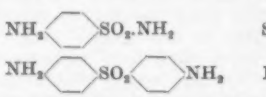
4. Wright, W. D. Researches on Normal and Defective Colour Vision. London, 1946.

1. Ellis, A. *Lancet*, 1942, i, 1.
2. Barnett, H. L., Forman, C. W., Lauson, H. D. *Advanc. Pediat.* 1952, **5**, 53.
3. Heymann, W., Spector, S., Matthews, L. W., Shapiro, D. J. *Amer. J. Dis. Child.* 1955, **90**, 22.
4. Heymann, W., Startzman, V. *J. Pediat.* 1946, **28**, 117.
5. Riley, C. M. *J. Amer. med. Ass.* 1952, **150**, 1288.
6. Metcoff, J., Rance, C. P., Kelsey, D. W., Nakasone, N., Janeway, C. A. *Pediatrics, N.Y.* 1952, **10**, 543.
7. Rapoport, M., McCrory, W. W., Barbero, G., Barnett, H. L., Forman, C. W., McNamara, H. *J. Amer. med. Ass.* 1951, **147**, 1101.
8. Lange, K., Slobody, L., Strang, R. *Pediatrics, N.Y.* 1955, **15**, 156.

One of the important effects of corticotrophin or cortisone in the nephrotic syndrome is a reduction of the abnormal glomerular permeability to the plasma-proteins of smaller molecular weight,[9] leading to a great reduction of proteinuria. This is usually associated with an increase of glomerular filtration-rate. Heymann et al.[10] consider that diuresis is unlikely unless there is significantly less protein lost in the urine, and they found that patients with the greatest reduction of serum-protein levels often had a delayed diuresis compared with patients less severely affected. The urine of nephrotic patients with severe œdema contains abnormally large amounts of the sodium-retaining adrenal steroid, aldosterone,[11] and in one such case [12] pure crystalline aldosterone was isolated. In a natural or hormone-induced diuresis, urinary aldosterone is much reduced at the same time as the output of urinary sodium increases.

ANTILEPROTIC ACTION OF DAPSONE AND DERIVATIVES

DAPSONE is now regarded as the drug of choice in the treatment of leprosy. The antibacterial activity of this sulphone was first examined because of its close chemical relationship to sulphanilamide.[13] Both dapsone (4 : 4′-diaminodiphenylsulphone) and sulphanilamide have two amino groups. In the sulphanilamide molecule only one such group is attached to the benzene ring, and its antibacterial activity is believed to depend on this ring being free :



It has been assumed that the antileprotic activity of dapsone likewise depends on free amino groups attached to two benzene rings. Certain di-substituted derivatives of dapsone, such as solapsone and promanide, have been prepared with a view to diminishing the toxicity (dapsone may cause hæmolytic anæmia and toxic hepatitis). But it has been argued that these derivatives are inactive per se, and owe their apparent activity to the liberation of dapsone in the body; and Francis and Spinks [14] showed that when solapsone and other soluble dapsone derivatives were administered orally they were converted into the parent dapsone in the stomach. But this explanation does not account fully for the antileprotic activity of these derivatives, because they are active when injected, and very little is then converted to dapsone. Francis and Spinks noted that dapsone itself is not excreted unchanged, but they did not identify the excretion products. Bushby and Woiwood [15] have now examined these, and those of solapsone, by means of paper chromatography and paper electrophoresis. They find that in man and the rabbit very little dapsone is excreted as such; only about 5% is recoverable from the urine, the remainder being a conjugate in which one of the amino groups is blocked by glycuronic acid. This conjugate is also present in the blood. Bushby and Woiwood have also examined the excretion products of the di-substituted dapsone, solapsone, both in man and in rabbits, and they find that when given parenterally it is not changed to dapsone. Evidently the two free amino groups are not essential for the activity of these sulphones. The picture is complicated by the fact that commercial solapsone contains some 15% of semi-solapsone, in which there is only one free amino group, one only of the two amino-groups in the parent dapsone being substituted. Bushby and Woiwood have shown that this mono-substituted derivative of dapsone has antibacterial activity, and that it is present in the urine of rabbits injected with pure solapsone free of semi-solapsone.

Not all the substituted derivatives of dapsone are converted in the stomach into the parent substance. Thus chromatography shows that 4-amino : 4′-carboxymethyl-amino diphenyl sulphone is excreted unchanged after oral or parenteral administration. According to Bushby and Woiwood there can be little doubt that dapsone exists in the body almost entirely as the conjugate, with one amino group free, and they suggest that the activity of dapsone in man is due to this mono-substituted derivative, the presence of two free amino groups being unnecessary for antileprotic activity. Certainly mono-substituted dapsone derivatives have antituberculous activity in guineapigs,[16] and, according to Cochrane,[17] the mono-substituted glycine derivative is effective in the treatment of leprosy; this compound is excreted unchanged.[15] The activity of solapsone administered parenterally might therefore be due to the presence of the semi-solapsone in the commercial product and to the formation of this in the body. If, as Bushby and Woiwood say, the body detoxicates dapsone, and the product of detoxication is also active, it would seem rational to administer dapsone in a substituted detoxicated form. Mono-substituted derivatives with a higher antituberculous activity than dapsone itself are already known.

DR. ALBERT SCHWEITZER, O.M.

Dr. Albert Schweitzer, musician, philosopher, and medical missionary, came last week to London to receive from the Queen the honorary membership of the Order of Merit. Their subsequent fireside chat on Bach's music, of which he is the greatest living authority and exponent, will, he says, be among the most treasured memories of a long life.

He came also to thank the friends who help to support his hospital at Lambaréné. After the Harveian oration on St. Luke's day he took tea with the president and fellows of the Royal College of Physicians. Later he attended a general meeting at the Royal Society of Medicine, and before signing his name as an honorary fellow he thanked his hosts for their assiduity in forging new weapons which men like he, who had never written a scientific article in his life, were able to use in the service of humanity. The Royal Society of Tropical Medicine and Hygiene entertained him to dinner and welcomed him as an honorary fellow. In his reply Dr. Schweitzer said that he was feeling very much at home in the tropical atmosphere which was now his native air. The honorary doctorate of laws, conferred on him by the University of Cambridge, gave him especial pleasure, for he maintains that he came to England through the gateway of Cambridge, where his old friend Professor Burkitt, whose grave he visited, had introduced his early theological works to the British public. Perhaps the highlight of his visit was one which illuminated but a lucky few—those who listened to him playing Bach on the organ of the Festival Hall late one evening, after the concert-goers had all unwittingly departed.

In December Dr. Schweitzer returns to his self-appointed task in Equatorial Africa.

THE next session of the General Medical Council will open on Tuesday, Nov. 22, at 2.30 P.M., when Sir DAVID CAMPBELL, the president, will deliver an address. The Medical Disciplinary Committee will meet on Wednesday, Nov. 23, at 2 P.M.

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9. Lauson, H. D., Forman, C. W., McNamara, H., Mattar, G., Barnett, H. L. *J. clin. Invest.* 1954, **33**, 657.
10. Heymann, W., Gilkey, C., Salchar, M. *Pediatrics, N.Y.* 1955, **15**, 49.
11. Luetscher, J. A., Johnson, B. B. *J. clin. Invest.* 1954, **33**, 276.
12. Luetscher, J. A., Neher, R., Wettstein, A. *Experientia*, 1954, **10**, 456.
13. Buttle, G. A. H., Stephenson, D., Smith, S., Dewing, T., Foster, G. E. *Lancet*, 1937, i, 1331.
14. Francis, J., Spinks, A. *Brit. J. Pharmacol.* 1950, **5**, 565.
15. Bushby, S. R. M., Woiwood, A. J. *Amer. Rev. Tuberc.* 1955, **72**, 123.
16. Smith, M. I., Jackson, E. L., Bauer, H. *Ann. N.Y. Acad. Sci.* 1949, **52**, 704.
17. Cochrane, R. F. *Practitioner*, 1951, **166**, 373.

In the Mental Hospital *

THE FORGOTTEN PATIENT

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I. THE PROBLEM REVIEWED

ALL now agree that mental hospitals are overcrowded and understaffed; and various means of remedying the situation have been proposed or adopted—notably the provision of more beds and the wider employment of partially trained nurses. But these remedies, or palliatives, have been put forward without sufficient examination of the problem to be solved. My purpose here is to indicate how bad conditions in mental hospitals arise and are perpetuated, and then to show that major difficulties can be overcome, and major reforms achieved, without much extra expenditure.

The Beds

There are two reasons for the overcrowding. The first is the absence of an adequate geriatric service: at De la Pole Hospital, for example, a fifth of the women patients should not be in a mental hospital at all, and could leave immediately if proper arrangements were made for their care. But the second and by far the more important reason is that psychiatrists have failed to cure and discharge their patients. If relieved of the burden of those old people who are at present admitted or retained for social rather than medical reasons, any mental hospital ought to be able to reduce each year, for a long time to come, the number of beds in occupation—even if the number of admissions continues to increase. The business of a hospital is to cure patients, not to hoard them; and the sheltering of patients in hospital without continual efforts to make them fit to return to the world is a complete denial of the functions of medicine. If attention is mistakenly concentrated on building additional wards and villas, the almost invariable result will be that these too will become overcrowded, because the last incentive to discharge patients will have gone. It would be wiser in fact for the hospital to knock down a ward every five years or so.

The Nurses

If an increase in the number of mental-hospital beds is undesirable, the more general employment of untrained persons as nurses is worse. Its effect can only be to make mental nursing a progressively less skilful occupation. What is happening at present is that we are enrolling as assistant nurses more and more people who have no intention of taking examinations. Where there is no great difference in the pay, married women naturally gravitate to the category of assistant nurse, because there they will have no examinations to take. Instead of encouraging this we ought to make it easier and more profitable for these women to take nursing examinations, as could be done within each hospital by skilled teaching, and nationally by offering a more valuable reward.

I have no wish to disparage assistant nurses: most of them have the qualities one is happy to see in trained nurses, and most of them are capable of passing the same examinations. There are first-rate assistant nurses who are very useful in a hospital. But mental nursing requires not only devotion and intelligence but also training. A mental nurse must be as able as any other nurse to look after physically ill patients—to manage their postoperative care and so on. He or she also needs other special skills—the ability to run an insulin-coma unit; to lead discussion groups with patients who are practically mute; to improvise entertainments; to nurse tactfully suspicious and resentful patients; to guard unobtrusively against suicide in depressed patients; to deal with the many problems which face the relations of patients; and perhaps from time to time face physical harm to himself in the interest of his patients.

Mental nurses are nearly all good people, and they are crying out to have their talents recognised and put to good use. They long to be allowed to nurse instead of being employed by psychiatrists as custodians; and one certainly cannot say that all of them are well occupied at present. If the days are past when they worked in the medical superintendent's house and gardens, they are still deployed in the most extraordinary tasks. No patient has ever improved as a result of working on a hospital farm; yet in many hospitals droves of patients labour in the field and cow-houses, year in year out, under the nominal care of a nurse. The nurse does not regard it as his duty to help the patients to benefit from their occupation. He rightly recognises that, though he is employed as a nurse, his duty is to work as farm labourer; and that is what he does. There are hospitals where 25 out of 200 male nurses may spend all their working day, from 8 A.M. to 5 P.M., on the farm, with only the slightest pretence that they are in charge of patients. I know a hospital where until recently the man who always milked the cows was a nurse and paid as a nurse. Sometimes a nurse spends his time cutting the grass on the hospital lawns; sometimes he works as a cobbler in the shoe-repair shop; often nurses are worked as porters; and I even know a hospital with a sewerage plant where a nurse is asked to stand in for the sewerman when he is away. Sometimes the whole policy of the hospital centres around the farms and gardens, and the chairman of the appropriate committee demands that nurses should be available for work on them in the numbers that he dictates.

Obviously all this is against the interest of the patients: but equally it is against the interests of the nurses. Nursing requires good men and women, and only in times of unemployment are the best candidates likely to survive such onslaughts on their professional ideals and ambitions.

If a hospital is a good hospital, it does not have much trouble in obtaining good recruits, many of whom will be keen on the work and enjoy it. But a large proportion of these will later leave; and the chief reason is poor pay. They want to nurse, and that is why they start: they think they can manage; and it is only after a year or so, when they contemplate marrying or having children, that they realise that they cannot make up their pay, as industrial workers do, by overtime. The basic pay is reasonable enough, but their actual income compares unfavourably with other people's. I feel pretty sure that there would be very little problem in obtaining nurses if their pay was made up to a reasonable amount.

For my part I see great hope for the chronic psychotic in a nursing staff which is better paid and better trained. There is in all young nurses some idealism—though too often the psychiatrist seems to try to extinguish it. Moreover, because psychiatrists perforce spend so little time with their patients, there is no branch of medicine in which the nurse is more valuable to the doctor. Every effort therefore should be made to develop the nurse's powers.

The Committee

Often one finds that years have elapsed since some of the members of a hospital management committee have visited the wards of their hospital; and these will be the members who will speak most strongly against reforms and the expenditure of more money. From this criticism one cannot exclude medical members, who are often more "conservative" than laymen.

* A group of articles chiefly concerned with the value of active occupation and work for mental patients and the means whereby it is best provided.

But it must be admitted that committee members labour under certain difficulties. The psychiatrist rarely welcomes them, and he is also at fault in a more subtle way. If a layman asks to be shown round a hospital, he will be filled with admiration by the excellent admission wards and convalescent villas and occupational-therapy centres, and will readily imagine himself falling ill and being treated with the skill and sympathy so manifestly offered. He will not so willingly recognise himself and his wife in the chronic wards: and on his first horrified visit he will ask the psychiatrist if nothing can be done to help these wretched patients. He will be told that nothing can be done: they are incurable. All that duty and humanity demands is that they should be clothed, fed, sheltered, and not allowed to die too young. This the layman will accept and he will thenceforward feel that he is right to resist reforms.

The Patient Stays in Hospital

The doctors have little incentive to discharge patients. In the first place a proportion of those discharged will inevitably require readmission within a few months; and that is a trouble. Again, if one discharges patients, and thereby succeeds in reducing the total number of occupied beds, this may mean that the senior nursing officers' salaries will be appreciably reduced without any consideration for their additional work. One knows too that, if a hospital succeeds in bringing down its numbers, the regional hospital board may tell it to accept so many patients from another and less active hospital; and one knows all too well the sort of patients who will be so transferred. There will be undiscovered consumptives; the patients whose wives or husbands live near the transferring hospital and who are only too glad to have visiting made impossible; and the Poles, Rumanians, and other foreigners who are held to be transferable because they have no relations nearby (though they may have had friends).

Examination of the lot of these foreigners, whose countries are closed to them as a result of the war, is instructive: to some extent it crystallises the lot of all chronic psychiatric patients. These men will have fought for the Allies during the war and deserved well not only of their own country but also of ours; and yet they are treated with what looks like calculated unconcern. They are scattered throughout the mental hospitals of this country, perhaps five to ten in most hospitals. In each hospital it is improbable that there will be any patient who speaks their language—unless it is held that all who fail to speak English have a common language. It is impossible that there should be a nurse who speaks their language, and almost equally so that there should be a doctor who can exchange a word with them. One would think that this would rouse the humanitarian interest of the authorities. Yet what is done? A foreigners' ex-Servicemen's organisation has been set up. Once or perhaps twice a year a representative will visit these men and have a few minutes' conversation with each; will give each man a few cigarettes and leave again. During the rest of the year an occasional national newspaper will be sent; at Christmas, more cigarettes.

If anyone should think that only foreigners treat their ex-Servicemen in this way, they are mistaken: for precisely similar treatment is meted out to our own ex-Servicemen when they become chronic psychotics. If a psychiatrist wants help for a chronic patient who is fit for discharge, he will waste his time if he seeks the help of ex-Service organisations. I well remember the civil adviser of such an organisation who wrote of a patient that he had been in hospital for so long that it was better he should remain there.

Nor can the civilian dismiss these things with a shrug of the shoulders; for they happen to him too. Once he becomes a chronic patient nobody will be interested in him. The Churches don't care; the Government doesn't care; there is no organisation which helps him, any more than there is one to help the foreigner or the ex-Serviceman.

Perhaps worse than the lack of any organisation to help the chronic patient is the lack of any organisation to see that he is well treated. Contrary to what is supposed the Board of Control does not perform this function. The task of the board is to see that the patient is not illegally detained; and anybody who regards it as a guarantee of satisfactory treatment would be quickly disillusioned by watching a routine visit to a mental hospital by the board's commissioners. The time allocated to these inspections is in my opinion too short for any good purpose to be served. I do not criticise the commissioners, but I do most strongly criticise the system. For several hundred patients to be inspected, together with their living quarters, in less than an hour, as so regularly happens, is sufficient reason for suggesting that some other way of safeguarding the patient's interests be devised.

Research

The public believe that effective research is going on to prevent mental illness and to cure it when it develops. Is their trust misplaced? Personally I think that it is.

The national bodies concerned with mental health and disease seem to me to lay too much emphasis on neurotic as distinct from psychotic illness. (After all, one can work and live for most of the time quite adequately with even a severe neurotic illness, but the slightest psychotic illness brings life to a standstill.) Believing, like most psychiatrists, that all psychoses are organically produced and largely independent of social events, I am impatient with those who ignore the very real and present needs of psychotics in favour of a long-term preventive policy of child guidance, useful though that may be.

As a young doctor the psychiatrist has been taught that recent illnesses are the most important; that work is more rewarding in a general hospital than in a mental hospital; that visiting patients in their homes is more important than work in a general hospital; and that community work for the world is most important of all. How many years is it since his teacher saw a chronic psychotic? Has the teacher ever had the care of chronic psychotics?

As one goes from mental hospital to mental hospital, reads psychiatric papers, and goes to meetings, one is driven to the conclusion that for the psychiatrist research is not something that arises out of work. It is an alternative to work, done in working hours to the exclusion of work. One sees that every psychiatrist would for choice work in a general hospital, in a university, or anywhere other than in a mental hospital: and for this one can hardly blame him, because there are no rewards for choosing the more difficult life save longer hours and great responsibility.

The Psychiatrist

Ultimately the only safeguard a chronic patient has is his psychiatrist; and how often, alas, the patient and relatives are unjustified in putting their faith in him. Unhappily, it is simply not true that in hospital everything possible will always be done to restore the patient to health; and this applies not only to provincial hospitals but also to many of the Metropolitan ones which look so nice and which are so respected.

In many of the latter one can see nothing to criticise when one is shown around. The wards are unlocked, even those of the long-stay patients; occupational therapists are busy not only in their own excellent departments but also (when necessary) in the wards. The gardens are well kept, and patients' clubs are run

by patients for their own advantage. There may even be large and well-furnished villas where patients with mild illnesses are admitted without any formality. There may be mixed units where elderly men and women eat and spend the day together. Sometimes it is the hospital's proud boast that in its occupational-therapy departments there is room for every patient.

In these hospitals the atmosphere is so pleasant that one feels that the millennium has really arrived; and one leaves with the warmest feeling of respect for the psychiatrists and the hospital's management committee. But sometimes, after expressing pleasure at an inspiring visit, one stops and wanders round again, seeking out the wards which one had not been invited to visit. And there things are as one feared. These wards may contain as many as a third of all the patients in the hospital; perhaps nearly all of these literally never leave the ward except to be crammed into a square of ground called the airing-court; perhaps many of them are always in bed in small rooms alone. They are clad in the shapeless garments so familiar to us; and if they are up they never wear shoes. Too often they are regarded as objects of disgust and even ridicule, and sometimes it seems that the attention paid them is less than that accorded to the hospital's pigs.

Even those hospitals which boast that all their wards are unlocked sometimes need a little closer examination; for they may have an arrangement with a neighbouring hospital whereby the latter will accept patients who become difficult to look after. The second hospital has no reputation to maintain and immediately locks these patients up.

Great improvements have been made; but far too little thought is being given, surely, to the vast residual problem of the patients whose active treatment has been abandoned and who are medically forgotten. When one tries to look at this problem it seems that among psychiatrists there is too much talk about irrelevancies. Too much talk about the supposed causes of mental illness, too many agreeable remedies which do nothing for sick mankind. Too many stratagems which do not blind the public, such as open days at hospitals when only the admission wards are shown. Above all too much talk about what could be done if only money were available, and not enough done to show that money is not the first essential.

More than anything what is needed is that each psychiatrist should think of himself as his patients' guardian. Legislation cannot protect them if he is not with them, not for them. Even if he works in the worst hospital in the country he can help his chronic patients, without the aid of anyone save his nurses. If conditions are difficult, he may take the more pride in what he and the nurses accomplish. Money will be granted when he has proved he will gladly work without it. He must remember that grandiose equipment is not what chiefly matters.

In my second article I shall provide evidence from my own hospital that by a change of emphasis and effort much can be done by simple means.

Special Articles

MARGINAL-PUNCHED CARDS

THEIR USEFULNESS IN MEDICAL PRACTICE

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"WHAT happened to that girl with pulmonary tuberculosis and diabetes whom I saw about three years ago?"

A clear accessible record which answers this question is a valuable confirmation of the memories that make up each doctor's own private experience over the years. A system that not only answers such a question but also produces quickly and easily all the cases of a certain disease or all the patients treated with a particular remedy makes records both more useful and more interesting. Such a system is provided by punched cards.

Punched cards of the machine-sorted type have been used for the analysis of scientific data since 1889. The first patent for the use of marginal-punched cards was taken out in 1896, but their application to scientific work is not recorded until 1920. It has been said that the idea for punched cards came to Hollerith while he was travelling by train, and watched the ticket-collectors punching the ticket margins in different positions, in accordance with the eye and hair colour of the passengers, so they could detect transfer of tickets. In the past fifty years much has been written on the use of punched cards in business and research, and the information has been summarised in two textbooks. The first by McGaw (1952) describes the use of these cards in libraries, but it is a useful manual for the beginner. The second, by Casey and Perry (1951) reviews cards of both kinds—the marginal-punched hand-sorted, and the centrally-punched machine-sorted.

A Simple System

I have found the following system practical both for patients' records and for indexing useful articles so that they can easily be found years later when their origin is forgotten.

Cards for Patients' Records

The cards I use (fig. 1) are 5 × 8 in., printed on a light cardboard material and perforated with about six holes to each inch.* On the face and back of the card the usual clinical data are written by hand or typewritten. Along the top margin the holes refer to necropsy, death, sex, primary diagnosis, age-group, and the first letter of the patient's surname. Along the other two sides and part of the bottom a second and third diagnosis can be recorded. The remainder of the bottom edge is reserved for coding treatment.

Coding

As medical diagnoses are many and complex, a code has to be used to record them. I use the classification published by the Medical Research Council (1944). Thus if the diagnosis is cancer of the stomach the number will be 1210. The appropriate holes are notched as shown in fig. 1. Should one of the digits be over 5, then 5 is notched and an additional hole also to make up the required number. This is done to save space. For the same reason the alphabet in the right-hand corner has been compressed. Each letter has to be located by notching in two places, and two sortings are needed to divide the cards alphabetically. For example, in fig. 1 the letter D has been notched. The first sorting separates the A's, B's, C's, D's, and E's, and a second sorting the D's from the others.

At first I thought of including the M.R.C. occupation code, but in practice I have not found this a useful notation and I have given it up in favour of coding a third diagnosis.

How to code treatment presents a problem. Ideally some chemical code which is expandable might be used. All these, such as the Dyson notation (Casey and Perry 1951), have proved too complex. I now use the index to a drug compendium published by Messrs. Eli Lilly, which I have expanded and to which I have added the list of operations given in the M.R.C. classification. Each

* These were prepared to my specification by the Copeland-Chatterson Co., Ltd., Exchange House, Old Change, London, E.C.4, and are sold as 'Paramount Case Cards.'

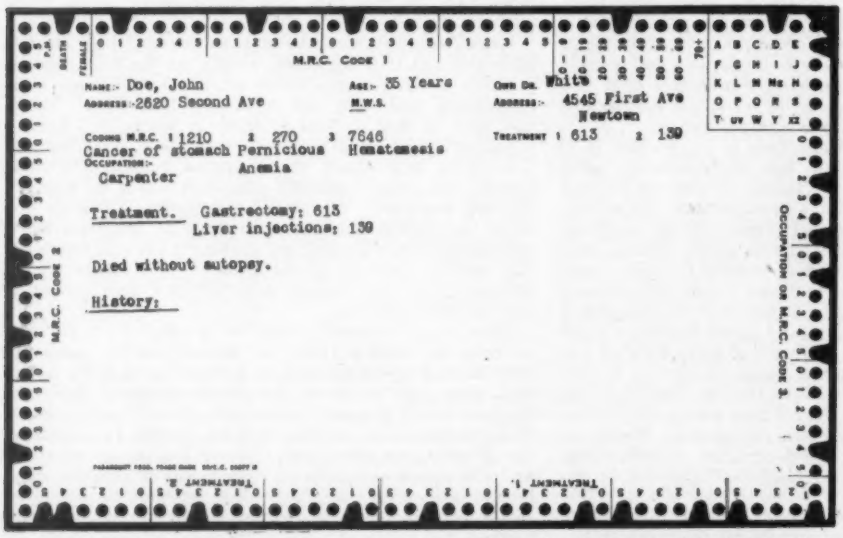

Fig. 1—The record of an imaginary patient has been written on this card. The data regarding the patient have been "notched" on the edges of the card as described in the text.

entry is numbered and I have left spaces for later additions (Smith 1953).

Cards for Literature Records

To avoid expense, for medical articles I use the same kind of card but of a different colour. The authors' names are written in the space for the patient's name, the reference under "Address," and the title opposite "Occupation." The first letter of the first author's surname is coded in the top right-hand corner. The eight holes for age-grouping are considered to be numbered 1, 2, 4, 7, and 1, 2, 4, 7, and the year the article was published is recorded as 37 (1 + 2 and 7) or 55 (1 + 4 and 1 + 4). I still use the figures marked M.R.C. code 1 for any diagnostic term in the title of the article. The code at the left-hand side of the card marked M.R.C. code 2 I use to record any non-diagnostic term in the title. I do this in a rough, but satisfactory, fashion by looking up the term in *Dorland's Medical Dictionary* (1951) and coding the page number on this code—e.g., prognosis 1219. Treatment 1 and 2 codes are used as for the patient's records. For a time I used the M.R.C. code 3 space to record the journal from which the article came, using a simple numerical code, but this has not proved useful. I now use this space for any special analysis and redesign it each time. This system is of great value in preparing bibliographies and reviews.

Fig. 2—Sorting of marginal-punched cards. The punch for notching these cards is shown.

Sorting

The cards are notched in accordance with the code. They are easily aligned by making sure that the cut upper right-hand corners are all in that position. Then knitting-needles are passed through the holes referring to the subject in question (fig. 2) and a gentle shake allows the cards that have been notched in this position to fall from the pack.

Discussion

In the seven years that I have used this system some improvements have suggested themselves. For instance, if I had used the notation 1, 2, 4, 7 throughout, more space would have been left on the card. Some of this space could be used to record the current year on patients' cards. Notes on death and necropsy are infrequent, and one punch would suffice. Better but more complex alphabetical indices to replace the one in the right-hand top corner have been developed (Casey and Perry 1951).

Shaw and Fisher (1946) with a simple photographic apparatus copy articles or summaries and eliminate transcribing errors. In the future punched cards might be made of photographic paper so that records could be transferred directly.

It is possible that a complete transfer of records to punched cards can be made with Kodak dry mounting tissue to attach existing records to new punch cards. Lawson (1948) has described how microfilm records can be attached directly to punched cards. He points out that six pages measuring $8^1/_2 \times 13$ in. (21·5 × 33 cm.) may be recorded on a 3 × 5 in. (7·5 × 12·5 cm.) card. My own first system consisted of standard filing cards with holes made by an electric drill. Sometimes this method would be applicable to existing records. Every doctor would be well advised to have a card designed for his own use.

The tremendous task of making available to the profession all articles referring to medical science has been explained by Rogers and Adams (1950). Without the use of punch cards—in this case I.B.M. cards—this formidable task could not be carried out. Similarly,

by the use of marginal-punched cards each investigator can make the literature more easily available to himself.

The photographs were taken by Mr. R. F. Carter.

REFERENCES

Casey, R. S., Perry, T. W. (1951) Punched Cards: Their Application to Science and Industry. New York.
Dorland, W. A. N. (1951) American Illustrated Medical Dictionary. Philadelphia.
Lawson, M. G. (1948) *Amer. Archivist*, **11**, 143.
McGaw, H. F. (1952) Marginal Punched Cards in College and Research Libraries. Washington, D.C.
Medical Research Council (1944) *Spec. Rep. Ser. med Res. Coun. Lond.* no. 248.
Rogers, F. B., Adams, S. (1950) *Texes Rep. Biol. Med.* **8**, 271.
Shaw, J. A., Fisher, E. (1946) *Science*, **104**, 180.
Smith, J. M. (1953) Treatment Index for Use with Marginal Punched Cards. Mimeographed.

HOSPITALS AND THE PRESS

A CONFERENCE of doctors and press organisations, held under the auspices of the British Medical Association with Dr. H. Guy Dain as chairman, has agreed on the recommended procedure by hospitals for the release of news about the condition of patients. The recommendations are as follows:

Sickness Cases

1. No information should be divulged to the press without the consent of the patient, beyond the admission on inquiry that the person concerned is a patient. Where, however, even this statement would be deleterious to the patient's interests, his presence in the hospital should not be disclosed without his consent. For example, in certain special hospitals, such as mental hospitals and sanatoria, where the mere admission of the patient implies the nature of the diagnosis, no information should be given to the press without the patient's consent.

2. In the case of well-known people (and subject always to the patient's consent) a brief indication of progress may be given, in terms authorised by the doctor in charge.

3. In the circumstances referred to under 1 and 2, where the patient is too ill to give his consent, or is a minor, the consent of the nearest competent relative may be accepted.

Accident Cases

4. (*a*) *Individual cases.*—The press should be given, on inquiry only, and at the time of the inquiry or as soon as possible afterwards, the name and address of the patient and a general indication of his condition. The patient's relatives should normally be informed before any statement is given to the press; but if it has not been possible to do so, this should be made clear to the press. Further information should be given only with the patient's consent.

(*b*) *Multiple cases.*—In accidents involving a number of people (for example, a railway or air accident) all reasonable steps should be taken to inform relatives of the injured before the publication of names, bearing in mind the necessity of early publication to dispel the anxiety of the next-of-kin of all other persons who were, or might have been, involved in the accident. Further information should be given only with the patient's consent.

5. Hospitals admitting accident cases should maintain a casualty book by reference to which inquiries may be answered.

General

6. All hospitals should ensure that a sufficiently senior and responsible officer of the hospital is at all times available, whether in person or by telephone, to answer press inquiries, and should nominate an officer or officers for this purpose.

7. When dealing with press representatives who call at hospitals and are unknown to them, such hospital officers are advised to ask to see evidence of accreditation in the form of a document issued by the press representative's newspaper, news agency, or photographic news agency, or a membership card of the Institute of Journalists or the National Union of Journalists.

8. Coöperation between hospitals and the press must depend on mutual confidence and good personal relations. Difficulties and misunderstandings should be taken up between the hospitals or board concerned and the local press.

These recommendations are to go for ratification to the bodies represented at the conference; and the Ministry of Health is expected to consult hospital authorities. The conference also approved an explanatory memorandum.

Public Health

Chemicals in Food

A JOINT conference of the Food and Agriculture Organisation and the World Health Organisation was held recently in Geneva, under the chairmanship of Dr. Norman Wright, to explore what action could be taken by the two organisations on the international level in the matter of chemical additives in food. All member countries were invited to this technical exploratory conference: 12 countries sent delegates, and 1 an observer; and 4 scientific groups were also represented.

The conference decided that international action on food additives was necessary because: (1) the potential health hazards were world-wide; (2) both the less-developed and the highly developed countries were exposed to these hazards, especially the latter, for they used a greater variety of additives; (3) the size of the problem made it impossible for a single country to undertake all the investigations needed; (4) apart from health aspects, food additives affected international trade and the free movement of foods; (5) many countries were currently reviewing their legislation on food additives; (6) laboratory facilities for work on food additives were inadequate in most countries and international coöperation was needed to put them to their most effective use. The first step should be to recommend uniform methods for evaluating the safety of food additives, and to formulate general principles governing their use. In addition, F.A.O. and W.H.O. should collect and disseminate information on pertinent legislation and on the various properties and effects of individual food additives. Finally, the two organisations should assist in the coördination of investigations, to prevent overlapping and duplication of research.

Of the classes of additives now in use, the conference recommended that priority should be given to the work concerning food colours, preservatives, and emulsifiers.

The situation has become much more complex since the synthesis of the so-called "coal-tar" *colours*. Over 2000 of these synthetic dyes have been prepared, but, fortunately, only about 80 are currently permitted in foods. There is at present no internationally agreed list for either natural or synthetic colours, although attempts have been made to obtain international acceptance, in Europe, of a list of 7 synthetic and 5 natural colours. The conference urged early consideration for this question.

Preservatives, including both antimicrobial agents and antioxidants, are of special value in limiting wastage and deterioration in food-supplies. They are of special importance for the storage and orderly disposal of surplus commodities. Finally, they are particularly valuable in tropical areas, where storage presents special problems. As antimicrobial agents are more extensively used, especially in hot climates, they should be given higher priority.

A Survey of Tuberculosis

A seven-week campaign of mass X-ray examination and tuberculin-testing was carried out in an industrial area of Northumberland in May and June this year. Blyth, with a population of just under 35,000, was selected as suitable for the survey because both its size and its nature as a comparatively isolated industrial town. A total of 20,900 people were examined by three mass-radiography units. This represented 60% of the census population over the age of 5 years, together with 1739 people working but not resident in Blyth.

About 1 in every 25 volunteers were recalled for large films. Among these, 40 cases of active tuberculosis were discovered—a rate of 1·9 per 1000 examined. As is usual, other important abnormalities were found, and some of these were dealt with by direct reference to the general practitioner or school medical officer and the chest clinic. A guarantee was made that every case requiring hospital admission would be offered an immediate vacancy.

Of the Blyth cases, 8 were potential sources of infection, and only 5 had symptoms that would have probably resulted in their diagnosis apart from the survey. Further examination

of contacts of active cases resulted in 2 additional cases being found, and the possibility of finding further cases has not yet been fully ruled out.

An interesting feature of this survey was the use of the tuberculin test by Heaf's multiple-puncture method. There was surprisingly little opposition from the public, and no less than 95% of those examined were tested. The tuberculin test was carried out by school medical officers in the schools, assisted by health visitors, who themselves carried out the testing of the public with the help of members of the St. John Ambulance Brigade. The postal method of reading, as previously tried in a small pilot survey, was used as the only practicable method of reading these tests, and a control of a 10% random sample was read twenty-four to forty-eight hours later by the health visitors. This check showed no serious error in postal reading; 2% were incorrectly recorded positive and 3% were incorrectly recorded negative. Used in this way, the value of the tuberculin test is not yet fully clear, but there can be little doubt that the results relating to a 60% sample of the community is of value in the search for further evidence of tuberculous infection in the borough.

The radiography units were concentrated on their proper work of mass radiography only; the large films were all taken in the chest clinic. Throughout the survey, one static unit was situated in a hall near the market square and two mobile units moved around the town according to need. Where possible they operated in public halls, but when this was impracticable a marquee was used. The survey began in the schools, which were covered in the first week, and achieved a rate of 88%. This had the advantage of bringing the survey to the notice of the majority of the population. Later the units worked in the shipyard, the collieries, and the light industries.

From the administrative standpoint, no difficulty was experienced in the apportionment of the cost above the normal expenditure of the X-ray units; this was shared about equally between the regional hospital board and the local authority. Most of the extra clerical work was done by volunteers. As in the pioneer Salford survey of 1953, the medical officers of health, chest physicians, school medical officers, health visitors, and clerks in the public-health department and mass-radiography teams all worked as a single unit and illustrated the close coöperation that can and should exist between the regional board and the local authorities.

Well supported by the press and the public, the Blyth survey was a model of how mass radiography can be used effectively and economically.

Poliomyelitis

Uncorrected notifications of poliomyelitis in England and Wales in the week ended Oct. 15 (41st week) showed a slight increase. The figures were (40th week in parentheses): paralytic 189 (186), non-paralytic 177 (164), total 366 (350). The total uncorrected notifications in the 41st week during the past six years were (percentage of paralytic cases in parentheses): 1950, 308 (72·4%); 1951, 94 (57·4%); 1952, 109 (84·4%); 1953, 124 (63·7%); 1954, 71 (70·4%); 1955, 366 (51·6%). So far this year the proportion of non-paralytic cases in England and Wales has been approximately 46·3% of the total. The figures for the whole of the preceding four years were: 1951, 41·5%; 1952, 29·8%; 1953, 34·6%; 1954, 32·8%.

Third Quarter in England and Wales

The Registrar-General[1] announces provisional figures for the quarter ended Sept. 30, 1955. Live births numbered 166,584 (a rate of 14·9 per 1000 population); in the corresponding quarter of 1954 the rate was 15·0. There were 101,647 deaths registered—9·1 per 1000 population, compared with 9·3 per 1000 in the third quarter of 1954. The infant-mortality rate was 21·6 per 1000 related live births, compared with 21·0 last year. There were 3897 stillbirths, or 22·9 per 1000 total births, compared with a rate of 23·1 in the September quarter last year.

1. The Registrar-General's Return for the week ended Oct. 15, 1955. H.M. Stationery Office. Pp. 20. 1s.

In England Now

A Running Commentary by Peripatetic Correspondents

THIS season of ducks for dinner is a time of rather mixed feelings. Barely four months have passed since Porter Fred rang up to say that a carton of day-old ducklings had come off the 7.32; undoing the box on the kitchen table, and the cold little webs wriggling over the children's fingers in a mutual squealing match of excitement; the snuggling acceptance of twelve balls of fluff beneath the dignity of a broody hen. The blossom on the apple tree was already set for sauce.

High summer saw prodigious growth. Those little yellow shovels scooped up crumbly meal with all the efficiency of open-cast mining. Their foster-mother clucked with frustration at the water edge; her bastard brood upended in derision. One was curiously flattened by the feeding bucket, and one just went by night to rat or weasel. The other ten survived for human pleasures. The drought was overcome by a self-appointed roster system in the horse trough, an inconvenience more than compensated by long hours of basking in the sun-drenched grass, one leg extended, beak tucked neatly over back. How I have often envied such torticollis for taking forty winks in car or cinema.

But even the nicest of ducks have their debit side. I wish Aylesburys were a little more constipated; the back-door steps are treacherous. I wish they did not take it upon themselves to sound reveille for the rest of the dawn chorus, or at least do it less raucously. I wish they would go to bed at sundown instead of causing me to stumble through the nettles to shoo them in and shut them in safe from foxes. The design of their under-carriages seems hopelessly inefficient for taxiing at present-day speeds: a small wheel on the sternum is the obvious modification for the next marks.

Squadron manœuvres also need working up. Progression in line astern is not only monotonous but out-moded since Farnborough. The sudden removal of the leader to the oven caused a degree of disorganisation quite out of proportion to the accepted principles of delegation, save for the smirk on the beak of Tail-End Charlie. Subsequent candidates for execution were picked haphazardly from the hut at night, but the survivors continue to honour their memory by maintaining blank files in the procession—a mute rebuke to Nemesis.

The last two shall go together to minimise psychic trauma. A bumper-size packet of frozen peas and the best of the cooking apples shall adorn their passing. When we have eaten our way through ten luscious ducklings another summer will be officially over, and we shall be in good trim to turn our thoughts to turkeys.

* * *

In one of your recent issues I noted that a hospital in the Midlands requested that their new R.M.O. should hold the M.R.C.P. (London). I am now awaiting an advertisement which stipulates that the new registrar at this or that hospital should have the school-leaving certificate (Oxford and Cambridge Joint Board), B.A. (Oxfd), B.M. (Guy's Hospital trained), and, of course, M.R.C.P. (London)—not to mention a full knowledge of the report of the Royal Commission on Monopolies.

* * *

I am an octogenarian, as my mother was before me—my father would have been one had he lived long enough. I know all about octogenarians, I realise their immense value, and am happily conscious that everywhere in England now, this is fully recognised.

But octogenarians were not always held in such high esteem. Not many years ago they were thought to be poor old people, who sat all day before the fire in large armchairs, wrapped in shawls and wearing caps. The old men wore smoking caps, rather the shape of those worn by Montenegrins, made of cloth and embroidered in green and red. As a child these caps greatly worried me. Why, I wondered, were they called smoking-caps, for many old gentlemen never smoked, they thought it rather a wicked habit. I supposed in my childish way that as most of them were bald they were worn to keep their heads hot, in fact smoking hot, and, of course, as a mark of distinction. This idea was somewhat confirmed

by the fact that lady octogenarians all wore lace caps. As most of them had enough hair for warmth, the cap was clearly to mark their dignity and their intrinsic superiority over lesser non-octogenarian folk.

Such caps as marks of distinction are now unnecessary; it is universally recognised that only the best people can become octogenarians; the lesser sort have not got it in them to stay the course or climb the heights. We owe this just appreciation entirely to our best-beloved elder statesman. It is because he is an octogenarian that he is most rightly and highly esteemed. Make no mistake about that. It is not because he led the British Empire to victory and undreamed of glory, but because he is an octogenarian. Immediately he achieved victory he was pushed out into the wilderness, but the moment he entered the ranks of the Immortals—that is, of the octogenarians—he was honoured in Westminster Hall and artists began to paint his portrait. Now he is regarded as the greatest of all back-benchers, because as an octogenarian he has taken a back-bench.

Since only the best people can become octogenarians, until the present reign our best queen has been the only octogenarian queen—Queen Victoria. Peace and prosperity always flourish where octogenarians rule, and I am reliably informed by a political commentator, not himself of course an octogenarian, that there is talk in political circles about the introduction of legislation to forbid the appointment of any but octogenarians to the post of Prime or any other species of Minister, and to insure that only octogenarians shall be eligible to stand for Parliament. Already, counting Schweitzer, ten of us belong to the Order of Merit.

* * *

An impairment of mechanical function in my car led me to my favourite garage where I am sure of getting a good opinion. After I had dilated for some minutes on the probable pathology of the defect and its obvious site in the anterior carburettor, I noticed a familiar look on the face of the garage proprietor. It was an expression often seen on the countenances of the greatest humanitarians at the end of a long outpatient session. Interested sympathy had been replaced, as my monologue progressed, by a glazed, bland bonhomie which scarcely concealed a modicum of impatience.

The pundit spoke. "Look, Sir, I'm not asking you to tell me what the matter is. That's my job. Suppose you just say what you notice wrong."

* * *

The other day we noticed that one of our clinic patients had a small accessory breast in an unusual position. Our secretary, usually so exact with medical nomenclature, wrote to the doctor thus:

"Dear Doctor,
Your patient is making satisfactory progress, but it was noted that she had a small mammal below the right inguinal ligament."

She may be right, of course—perhaps it is just a mole.

* * *

Our donor files suggest that religion holds a high place in our region. I suppose the same applies in other parts of the country, but certainly Bishops, Deans, Canons (albeit with two Ns), Priests, and Deacons abound here. True we have no rector, but we *do* have a Vicker (sorry!), and there are a number of Ministers. Indeed our spiritual welfare is well looked after, for we also have Abbotts, Monks, Nunns, and a Friar.

There are Sees for the Bishops and adequate Churches, both Norman and Saxon, for the other dignitaries. In fact there are Parishes for all. But there are hardly enough Churchyards to accommodate all the Graves and Tombs. Two Sextons keep things tidy and help to make up for the lack of a verger, and there is more than one Churchman to listen to the Sermons. These are preached without any accompanying service, perhaps because we have no organ, no choir, no choristers, not even an organblower. But there is no lack of Bells, we have plenty: our trouble is that we have but one Ringer.

* * *

News from the tissue-culture laboratories

We hear that in addition to glass, 'Cellophane,' 'Polythene,' 'Formvar,' and various plastics, the tissue-culture men are now growing their cells on rayon. "I say Wotherspoon, isn't it damnable—I've just got a ladder in my cultures."

Letters to the Editor

DEATHS AFTER ANÆSTHESIA

SIR,—Your annotation last week draws attention to what must be the greatest source of concern to anæsthetists today. Macintosh[1] stated that whilst anæsthetists are aware of the necessity for supervising the airway—during anæsthesia—"for some unknown reason the same anæsthetist may then lightheartedly hand over the unconscious patient to a junior nurse who puts the patient flat on his back in bed and leaves him unsupervised and often for considerable periods. Many deaths have resulted." He is also of the opinion that a greater number of deaths from *faulty anæsthetic technique* occur after the patient is returned to bed than on the operating-table. It should be stressed that to leave an unconscious patient in the care of a nurse or orderly who is not adequately trained to supervise him is regarded as faulty anæsthetic technique.

Practically all of these deaths could be prevented by the provision of proper facilities for the care of patients following anæsthesia. In America, since the opening of a post-anæsthesia room at St. Mary's Hospital, Rochester, in 1942, it has become widespread practice to provide special accommodation for patients in the immediate postoperative phase. A recent survey of the American Hospital Association showed that out of 6076 hospitals 1100 provide special post-anæsthetic facilities for the patient. It is a remarkable fact that only one such unit has been described in this country.[2]

The advantages of the recovery ward are too numerous to mention here, but suffice it to say that in a hospital so equipped suction would be provided for anyone needing it within a matter of seconds.

Newcastle upon Tyne. P. HEX VENN.

POLIOMYELITIS IN NORTH-WEST LONDON

SIR,—I see that I have been reported as having said in London recently that the present epidemic of poliomyelitis was due to a new type of virus. May I be allowed to explain? In discussing the cases that occurred in North-West London during August, I said that the high proportion of non-paralytic to paralytic cases and other anomalies (the absence of polymorphs from the cerebrospinal fluid in so many cases) had given rise to the speculation that this might not be poliomyelitis at all, but another infection. However, such cases as had been investigated had revealed the presence of poliomyelitis virus, albeit type III "the first time, so far as I know, that this type has been encountered in this country." Incidentally, I also note that this remark has given rise to the speculation that it may have been imported by West Indians, who I understand form a large colony in that part of London.

Considering that we form the adjoining area in Middlesex, the contrast between the Willesden experience and our own during the present epidemic is striking. Whereas in the early stages non-paralytic cases appear to have formed about 80% of the Willesden cases, in our series to date they comprise less than 25%. Some of this might no doubt be accounted for by better reporting in Willesden but I can hardly believe that this alone can explain such a large discrepancy. In our area, moreover, the only case investigated yielded virus type III.

Very pertinent to all this, Sir, is the question of facilities for virus investigation available to the ordinary practitioner in hospital or in general practice today. The Virus Reference Laboratory at Colindale—to the best of my knowledge—has to cope not only with London and Greater London but with the entire South of England. Virology represents today one of the rapidly growing

1. Macintosh, R. R. *Brit. J. Anæsth.* 1949, **21**. 107.
2. Davies, R. M., Hunter, J. T. *Lancet*, 1952, **i**, 865.

points of medicine, and, unless we are prepared to fall hopelessly behind the Americans in the hunt, I submit that this provision is inadequate. By its very nature the Colindale laboratory can scarcely be expected to do routine work, and indeed, considering its commitments, it would seem impossible that it should. None the less, routine virology must become available if we are to make any progress. More facilities, I submit, are urgently required.

South Middlesex Hospital, Isleworth, Middlesex. G. E. BREEN.

SIR,—The statement that there have been a large proportion of non-paralytic cases during the present epidemic of poliomyelitis could be based upon uncorrected figures, depending upon the numbers admitted to hospital. Our experience of those admitted to Neasden Hospital between July 5 and Oct. 10 has been: non-paralytic, 161; paralytic, 91 (the usual proportion at this hospital in recent years, about 2 to 1).

Amongst the *non*-paralytic cases, 43% had a biphasic illness, and 85% had cerebrospinal fluids examined. Of the latter, 58% were abnormal in having usually a lymphocytic pleocytosis and raised protein content.

The clinical picture, with the proportion of paralytic cases and seasonal incidence, gives me no reason to doubt that the disease is poliomyelitis until any later virus laboratory reports show that some of the non-paralytic cases in particular may be due to a different virus.

Neasden Hospital, London, N.W.10. W. F. TWINING MCMATH
Physician-superintendent.

VITAMIN E

SIR,—I have just read in your issue of Oct. 1 a report on the 3rd International Congress on vitamin E held in Venice in early September.

The account suggests that "sceptics" might ascribe some of the results illustrated in our "impressive" photographs to "spontaneous recovery" and could duplicate them "under the influence of adequate hospital treatment." It goes on to imply that perhaps α-tocopherol is only an "expensive placebo" after all. Surely, I could not have made the details of our case studies clear, because we have never yet seen a doubter whom the photographs failed to persuade. The unconvinced are merely those who have not seen and understood them. Some were on display at the combined meeting of the Canadian Medical Association and the British Medical Association in Toronto in June, where many of your readers may have noticed them.

The illustrated results were achieved mainly in desperate cases. For example, all the gangrenes were cases where excellent surgeons at excellent clinics had advised amputation or had already performed partial amputations. We took the patients out of hospital and rescued them with α-tocopherol. I showed ulcers of long duration that had resisted every other treatment in hospital. α-tocopherol cured them while ambulant. I also showed conditions such as facial wounds and burns which would have healed if left alone or if treated by any traditional method. The point I made was that on tocopherol therapy they healed unusually quickly, one of them healing thus after grafts had failed, and *without contraction of scar*. Where has this been seen before? Of course, phlebitis may resolve with traditional treatment or if anticoagulants are administered, but what *safe* agent can heal such a case in five days while the patient continues with her housework? I showed such a patient. Almost all of the patients illustrated were treated in the office. 17 of the 21 came to us in despair *after the best hospital treatment had failed*. Surely, there is a limit to continued doubt, although I suppose there have always been men who would not believe unless they could put a hand in the wounds.

More than 300 papers have now appeared lending support to our cardiovascular observations of 1942–48. That is a not inconsiderable volume of corroboration in so brief a time. It should give pause to a calcified sceptic.

I could wish, too, that your report had stressed not only the strong support we received from O'Connor and Lambert, but the equally notable corroboration from Schmidt, of London, and Tusini, of Genoa. And you might have mentioned Dr. Foa, president of the congress and professor of medicine at Milan, who told the meeting that many of our results had been duplicated before his eyes by a colleague.

Many a limb and many a burn will continue to be needlessly jeopardised if our photographs are not taken at face value. Their inescapable implications with regard to heart-disease should not be overlooked.

London, Canada. EVAN V. SHUTE.

PENNYROYAL POISONING

SIR,—Dr. Vallance's interesting article last week refers to "*Mentha pulegium* which is found in Spain, the south of France, and Algeria (*Extra Pharmacopœia* 1952)." This needs some correction, because it is not uncommon in this country. Clapham et al.[1] say this about its British distribution:

"Native. Wet places on sandy soil. Very local but widespread in S. England becoming rarer northwards; in Scotland only known from Ayr and Berwick; in Ireland mainly in the S.W. and N.E., also Wexford and Dublin; Channel Is."

De la Pole Hospital, Willerby, E. Yorks. J. A. R. BICKFORD.

THE PHYSIOLOGY OF CHANNEL SWIMMERS

SIR,—Unless I misinterpret him, Dr. Robertson (Oct. 15) regards the chief advantage of adiposity in Channel swimmers as that of providing a source of fuel for the physical energy expended, apparently disregarding the nutriment ingested during the course of the swim. He goes so far as to indicate that in the case of one performer there was a store of potential energy, the equivalent of 180,000 calories, which would enable him to swim for 300 hours (a very convenient means of reducing obesity were it practicable). He visualises ketosis as occurring in Channel swimmers. This I should have thought would be only one and not the worst of the discomforts and inconveniences incurred from living on one's fat.

As a contrast he notes that the marathon runner carries little reserve fat upon which to draw. Maybe my biochemistry is not above expert criticism, but for what they are worth I offer these details.

In a man weighing 60 kg.—a reasonable average for a marathon runner—the liver may be estimated at 1500 g. containing 15% glycogen. His muscles constituting 40% of the body contribute 1·5% glycogen; or, in all, 585 g. are available.

The first-class marathon runner inspires 3 litres of oxygen per min. for rather less than two and a half hours, so that 560 g. of carbohydrate are consumed; the combustion of fat therefore need be minimal. True, there is loss of weight; Dr. Robertson says 3–8 lb., "part of which is loss of moisture." For "part" I would substitute "most." I have on one occasion seen as much as 9 lb. lost which was regained within 48 hours.

I am aware that American observers have correlated the exhaustion of runners at the finish of the marathon with blood-sugar levels. No doubt the resemblance of their symptoms to those of hypoglycæmia encourages this explanation, but there are several factors (hyperpyrexia, dehydration, salt depletion, peripheral circulatory failure, low-grade toxæmia, and so on) all contributing to the condition of collapse, and it is not possible to isolate any one of a variety of functional stresses imposed simultaneously. If my figures are correct, hypoglycæmia is not to be expected.

The ability of women to compete with men as Channel swimmers and even surpass them, I am not prepared to explain. The quantity and disposition of adipose tissue must be a vital factor not merely to resist hypothermia but perhaps in conferring buoyancy and other technical advantages which with my limited acquaintance with swimming I am unable to supply. Moreover, it must be

1. Clapham, A. R., Tutin, T. G., Warburg, E. F. Flora of the British Isles. Cambridge, 1952.

remembered that in protracted feats of endurance physical attributes alone are not concerned. Other qualities, emotional and psychological, are demanded: patience to rise above monotony; courage, fortitude, stoicism, to endure fatigue, hunger, thirst, discomforts of all kinds; resolution to push on and resist the clamant impulse to rest. Perhaps in these respects, women possess superiority. No woman has, as yet, run over the marathon course, at least officially. In 1928 (on a very hot afternoon), one started from Windsor and ran a distance of about 20 miles in 3½ hours, completing most of the remainder of the course to Stamford Bridge in a motor-car.

Not that I doubt the capability of some of our girl athletes to complete the classic 26 miles 385 yards. Some of their recent achievements encourage such an expectation. To select only one, Mrs. Sheridan, half an inch under five feet, and weighing 8 stone, has pushed a bicycle 238 miles in 12 hours and has ridden from Land's End to John o' Groats in 2 days 11 hours—only 5 hours longer than the record-holding male. At a guess, a girl long-distance runner who undertook the necessary training would run over the marathon course in 4 hours and perhaps a few minutes faster.

London, W.1. ADOLPHE ABRAHAMS.

TREATMENT OF CUSHING'S SYNDROME

SIR,—In regard to your valuable leader last week, there is now no doubt, in the minds of those in contact with the clinical results, that bilateral subtotal adrenalectomy is a valuable method of treatment. The success of this major surgical procedure, and the reduction of the mortality-rate to very small figures, has been made possible by cortisone.

Since bilateral adrenal hyperplasia is much more frequent than neoplasia as a cause of Cushing's syndrome, the importance of such a surgical approach being perfected is obvious. One of the, as yet, unsolved problems is the amount of adrenal tissue to be left behind. On the one hand, the patient may be left with chronic adrenal insufficiency requiring permanent cortisone therapy and, on the other, the remnant may undergo hyperplasia and clinical relapse occur. In many the balance is happily struck, empirically, and not only may the patient remain completely well, but, as in one woman of 23, operated upon by Professor Rob in 1952,[1] she may subsequently pass through a successful pregnancy, without a relapse in her condition, in spite of the tendency to adrenal hypertrophy in pregnancy. However, the incidence of relapse is sufficiently great in the experience of some surgeons to lead them to advocate total adrenalectomy, a very radical measure, with the great disadvantage of continuous cortisone therapy and all the vicissitudes of adrenal insufficiency even in the cortisone era. The problem is, in some ways, comparable to thyrotoxicosis but with more severe consequences.

You write of "further advances." One method of approach would be the discovery of a rare radio-activated element for which the adrenals (or the pituitary) had a selective affinity; another, the inhibition of the pituitary gland (corticotrophin) by a steroid of similar formula to cortisone but with minimal biological effects; or perhaps the relatively unknown territory of the hypothalamus may yield to exploration.

A different angle is the question of extension of the procedure to severe cases of pituitary-adrenal hyperfunction, which would not strictly justify the name of Cushing's syndrome. Sprague's diagnostic caution in this connection, which you repeat, should be remembered, but "when is a Cushing's syndrome not a Cushing's syndrome?" is not merely a frivolous question. Why do some otherwise typical cases not have diabetes, and others diabetes but no osteoporosis? The problems of variety and gradation of pituitary-adrenal hyperfunction involving, in the main, glucocorticoids and androgens are indeed involved,[2] but rigid criteria for a syndrome, or an eponym, are often too exclusive or inadequate, for many allied clinical conditions, involving morbidity, and requiring diagnosis and treatment.

1. Simpson, S. L. *Proc. R. Soc. Med.* 1953, **46**, 39.
2. Simpson, S. L. *Postgrad. med. J.* 1953, **29**, 184.

London, W.1. S. LEONARD SIMPSON.

HYDROCORTISONE IN PAINFUL SHOULDER

SIR,—What a pity to see that hydrocortisone is being used indiscriminately, giving results that might cause the medical profession to decry its usefulness.

The article by Mr. Murnaghan and Mr. McIntosh (Oct. 15) was a great disappointment to me; being interested in the treatment of lesions in and around the shoulder by hydrocortisone, I had hoped to learn something. It seems that the only examination performed was the assessment of range; selective testing of all tissues that might be at fault was omitted. An accurate diagnosis, therefore, could not be made and hydrocortisone should not have been used. I believe that the dramatic improvements were due to the injection being given by chance to the correct spot, the failures due to the wrong spot being chosen.

The results bear out the fears of Cyriax and Troisier.[1] Their experiences, and mine too, show that a pin-point diagnosis should be made before an injection of hydrocortisone is used, this diagnosis being based on Dr. Cyriax's method of testing active, passive, and resisted movements separately. Then, and then only, can an accurate judgment be passed on the usefulness of hydrocortisone.

London. R. BARBOR.

SIR,—Mr. Murnaghan and Mr. McIntosh have rendered a disservice to orthopædic medicine. They have not undertaken diagnosis by correlating the results of testing active, passive, and resisted movement. In our paper on hydrocortisone [1] Troisier and I laid all the emphasis we knew on this clinical method of singling out the lesion. Their omission leads them to find diagnosis difficult at the shoulder. Indeed yes; I for one would find it impossible, were I restricted to measuring the active range. Even so, having found the range limited in a manner suggesting arthritis, they inject in various places but not (as we described) into the joint itself. No wonder the results were unimpressive; for hydrocortisone exerts its anti-inflammatory effect only where it is placed.

London, W.1. JAMES CYRIAX.

SIR,—Reviewing their controlled trial on the treatment of painful shoulder by local injection of hydrocortisone, Mr. Murnaghan and Mr. McIntosh found that lignocaine was equally as effective as hydrocortisone, and concluded that hydrocortisone had no specific effect on the painful shoulder.

I think there is a simple explanation of the disappointing results in the cases which received hydrocortisone. Mr. Murnaghan and Mr. McIntosh, having pointed out how difficult it is to diagnose and treat pain arising in the shoulder joint, proceed to put all their eggs in one basket by limiting the site of injection to the subacromial region.

It was on account of the difficulty in localising the precise source of the pain and because we felt that the inflammatory condition was often widespread, that in our series at Guy's Hospital [2] we made a practice of injecting the shoulder joint in three places—namely, in the region of the long head of the biceps, the subacromial bursa, and posteriorly into the joint. Whereas Mr. Murnaghan and Mr. McIntosh endeavoured to inject all the hydrocortisone into the capsular and peri-capsular tissues only, we deliberately injected some of the solution into the subacromial bursa and the joint-space itself as well as into the peri-articular structures. The

1. Cyriax, J., Troisier, O. *Brit. med. J.* 1953, ii, 966.
2. Crisp, E. J., Kendall, P. H. *Lancet*, 1955, i, 476; *Brit. med. J.* 1955, i, 500.

inflammatory process usually involves the synovial membrane, and the most rational method of bringing the hydrocortisone to bear on it is by intra-articular injection.

In analysing their results it is a pity that the authors did not attempt any classification, separating the acute cases from those in which the onset was insidious and the condition chronic. In my experience acute "capsulitis" of the shoulder, whether traumatic, infective, or metabolic in origin, usually responds dramatically to the intra-articular injection of hydrocortisone.

It is worth mentioning in passing that the acute capsulitis which sometimes follows a trivial elbow injury resolves in a similar manner following intra-articular injection of hydrocortisone.

Although the chronic "frozen shoulder" is naturally less responsive to the injection of hydrocortisone, nevertheless this form of treatment is of the utmost value and effects much saving in physiotherapy. By reversing the inflammatory process pain and spasm are relieved and the patient enabled to carry out active exercises to mobilise the joint. Of this type of case, at least 50% can be expected to regain full movement in a matter of weeks rather than months.

If manipulation under anæsthetic is necessary an injection of hydrocortisone into the joint will expedite recovery by preventing the formation of further adhesions.

Finally, I would stress the very real value of hydrocortisone in the treatment of painful shoulder conditions.

London, W.1. E. J. CRISP.

NURSING BY THE MOTHER

SIR,—Dr. Pickerill's letter of Oct. 1 describes the value of nursing by the mother from the surgical point of view.

Recently an infant of three months was operated upon for the relief of an umbilical hernia and the whole of the nursing was undertaken at home by the mother. From the surgical and cosmetic point of view results were excellent but other benefits were unexpectedly obtained.

The baby was born by cæsarean section on May 24, 1955 (33rd week of pregnancy), weight 3 lb. The mother had a severe toxæmia and was unable to feed the infant, being discharged from hospital before her on June 8. The infant was not sufficiently large to be discharged until July 15, when she joined her mother. On July 22 the mother was readmitted for ten days for further examination, the child remaining with the grandmother deep in the country. They returned to Malvern about Aug. 15, attending the welfare clinic on Aug. 23 where she was seen by one of us (H. F. G.).

The child then weighed 8 lb. 4 oz. She was rather thin and pale and somewhat restless and uncomfortable. No cyanosis was noted. A loud systolic murmur was heard over most of the precordium. A large central umbilical hernia, $^3/_4$ in. in diameter, protruded $1^1/_2$ in. from the navel. It was easily reducible though the neck was very small. An attempt to control it by strapping failed.

On the morning of Aug. 25 the child became very uncomfortable and the mother was unable to reduce the hernia. She panicked and set out for the family practitioner (A. L. B.). Passing the clinic on the way, she called, where the child was seen by the health visitor and then by one of us (H. F. G.). The hernia was now barely reducible. It was arranged between us that surgery was needed at once and Mr. P. W. Houghton was asked to see the infant. He agreed that admission to an infants' ward was undesirable.

On the morning of Aug. 26 mother and infant were taken to hospital, where, after preliminary hæmoglobin estimation, Mr. Houghton removed the hernial sac and repaired the abdominal wall. The child was returned from the theatre to a side-ward where she was left with her mother for five hours to recover. She was then taken home in a hospital ambulance car. She was a little restless that night but otherwise made an uninterrupted recovery, the stitches being removed on the fifth day.

Owing to the mother's illness and her second admission to hospital, she had little opportunity of getting to know her daughter before the operation nor had she gained any confidence in her ability to look after her. Her lack of self-confidence was such that she was afraid of being left at home alone with her daughter and even afraid to make up a bottle feed or change the napkin. After the operation she needed the daily encouragement of the family doctor and health visitor for a week, by which time she was fully confident of her own ability and a normal satisfactory mother-child relationship had been established. Mother and child became contented and placid.

To operate at that time was essential, yet it was felt that the risk of infection in this child, who was almost certainly anæmic, was so great that it was not justifiable to admit her to any ward anywhere. So this happy result was brought about accidentally. We were all impressed by the way in which the sharing of the ordeal of operation by mother and child seemed to establish proper relationship between them so rapidly and completely, and by the improvement in the condition of both. This result suggests that other benefits in addition to freedom from secondary infection could be obtained by extending the range of surgery carried out, without separation of mother and child by admission to hospital.

We should like to extend our thanks to Mr. Houghton for his coöperation and help, and to Miss Hudson and Miss Wylde, the health visitors concerned.

Malvern, Worcs. A. L. BROWN
H. F. GREEN.

SIR,—We are very pleased to know that Mr. Oldfield (Oct. 8) is still much in favour of our nursing methods and finds in them considerable advantages, but I think he should now have the courage to advance a little further.

In my letter of Oct. 1, it is stated that "by abolishing the pool of infection in a common ward and by preventing transference from patient to nurse to patient . . . operative and nursing procedures could be very much simplified"; and then are given examples of such simplifications with their added advantages. These simplified methods are *not possible* if there is an open ward and if nurses handle babies. For fourteen years I used gloves and all infants had highly skilled intratracheal anæsthesia; then, with the abolition of the common ward and adoption of full mother-nursing in single rooms for *every* infant, "intratracheal" anæsthesia was abandoned and gloves gradually given up, with extraordinarily better results—unbelievable perhaps but true.

As to gloves, the utmost delicacy of touch is required in infant surgery both in making small accurate measured incisions (as for instance in a Le Mesurier operation) and in getting absolute accuracy of adaptation and in tying secure knots with extremely fine nylon sutures. Many wound closures have minute, almost invisible crevasses, but nevertheless quite wide enough for many organisms to enter, or afterwards they show where sutures have cut and so provided other entrances. I aim to have none such by inserting twice or three times as many sutures as usual, with tension carefully adjusted so that the sutures do not cut, yet the margins are in continuous and absolute adaptation; and I do not believe that these things can be done with tight rubber gloves destroying the necessary tactile sensation. I think that operations on infants require the same order of controlled fine digital action as playing a violin or repairing a wrist-watch.

Yesterday I removed the sutures from an infant with an abdominal tube-graft, for the construction of which no gloves were worn; the suture lines on the tube and abdomen were perfect, no sign of infection and the graft a beautiful colour. But I would not have dared to do that if the child had been brought to the theatre from an open ward, because from experience of both methods I am certain that with the patient also comes a large sample of ward organisms and that it is impossible to prevent this, despite the most careful precautions; and I feel sure too that ward organisms are already in the infant's mouth and pharynx and so may get carried down into the bronchi by an intratracheal tube. Moreover, the rubber of the tube has a harmful effect, I believe, on delicate (ciliated) epithelium, just as it has in veins and in the urethra.

Naturally "no gloves" means more meticulous scrubbing up and we take surprise swabs from hands and fingers to check on this.

As to anæsthesia, I would suggest to Mr. Oldfield that he should persuade his anæsthetist to try ether through which

oxygen is bubbled and delivered to the nasopharynx only, through fine nasal catheters connected by a Y-piece—almost as simple as the old "Junker." With the infant's head dropped a little (a child's eustachian catheter makes the best sucker), a skilled anæsthetist will get a perfect anæsthesia, *very* quick recovery, and absolutely no postoperative tracheitis or bubbling chests; it is for infants a great advance on intratracheal, to which I would not wish to return under any consideration whatever. With this as the routine method there has been no anæsthetic death, nor any incident even, for thirteen very busy years, and it is extremely rare for any infant to get any rise in temperature. What better could one want?

There is a tendency nowadays for the adulation of the complicated and the difficult; at this hospital an endeavour is made to reduce every procedure to its simplest possible form, consistent with perfect safety to the patient, and it is found to pay good dividends. "The simpler it is the better it is."

Bassam Hospital,
near Wellington, New Zealand. CECILY M. PICKERILL.

EPIDEMIOLOGY OF TUBERCULOSIS

SIR,—Your first leading article last week does less than justice to the epidemiological work of medical officers of health. There is nothing magical in the epidemiology of tuberculosis that should suggest its transfer to some super authority with appropriate super-epidemiologists. If we can be entrusted with the epidemiology of smallpox, poliomyelitis, and all the other notifiable diseases, our practice can be applied efficiently to tuberculosis. Epidemiology is not only an academic study but, in the prevention of disease, requires the appropriate administrative control measures which largely depend upon the resources of the local authority.

Health Department,
Brighton. W. S. PARKER
Medical Officer of Health.

PNEUMONECTOMY

SIR,—Your leading article of Oct. 15 will doubtless stimulate further interest in the treatment of lung carcinoma, and I should like to comment on it. So many factors are involved in the treatment of this disease, and it is itself so diverse and unpredictable that a search for the best single treatment would seem a fruitless task.

It seems that, in comparing the gain from conservative as opposed to radical operative treatment, as your article does, two entirely separate problems exist. One, the results to be gained from conservative treatment of a particular case of lung cancer, and the other, the contribution that conservative treatment can make to the over-all management of lung carcinoma—a disease in which satisfactory methods are almost pitifully inadequate.

As far as the former is concerned, it may be true for a squamous-cell carcinoma, situated centrally in a lobe and without glandular involvement, that radical pneumonectomy offers no greater freedom from local recurrence than a lobectomy. Which is the "best" operation will be decided by the surgeon's experience, judgment, and skill—gifts which are distributed equally between the conservative and his radical colleague. That a convincing answer is not yet available to this simple question is a serious reflection on methods of accumulating and correlating data on a country-wide basis.

The answer to the other problem can, in part, be provided by considering the 30% or so of patients who, it is generally stated, are at operation found to be inoperable. The only chance of improving this figure is by radical measures if one assumes that removal of the growth offers the only hope of cure, and provided the patient's distress is not increased in taking this chance. About 25% of patients are, at operation, found suitable for lobectomy. If your article is contrasting the results of lobectomy with radical pneumonectomy for this group of patients, a small proportion of the whole, your conclusions are a valuable indication of the operation offering a high survival-rate with comfort to the patient—namely, a lobectomy. The price, however, that 3 patients from my own small series of lobectomies have paid for increased postoperative comfort and well-being, is recurrence of the growth in the remaining lobe without metastasis elsewhere in the body. These were young and robust patients and I see no reason for supposing they would have succumbed to the more radical operation of pneumonectomy.

Warwick. R. ABBEY SMITH.

THE CLIMATE OF DISCOVERY

SIR,—When two professors of medicine fall out about the respective rôles of art and science in medicine, cynics may well laugh, while simpler souls without chairs may timidly feel that here are great matters beyond their ken.

Yet the theme is an old one, and often expounded, and it is a little disquieting that two distinguished physicians, both vowed—as it were—to the education of the doctors of the future, should seem to be at odds upon so important a matter.

Perhaps the difference is one of linguistics only, and this may easily be the case since neither writer has thought it necessary to define what he means by art in medicine, and so we cannot know whether or not they are both dealing with the same thing or notion.

In his chapter "Of Reason, and Science" in *Leviathan*, Hobbes tells us "how necessary it is for any man that aspires to true knowledge, to examine the definitions of former authors; and either to correct them, when they are negligently set down; or to make them for himself," and much more to the point about precision of language. Hence to suggest that the notion of art in medicine is sentimental obscurantism can be true only when the writer does not define his terms and thus imparts obscurantism to his exposition.

Yet worse is still to come, for in Professor Arnott's brave new world of medicine where *all* is science, to use operative terms without making their reference plain is to sin against science itself and to befog the climate of discovery.

One cannot withhold sympathy from Professor Platt (Oct. 22) in this sad lapse of his academic colleague, so pregnant with meaning.

There should, however, be comfort for him in the following passage from Aubrey's *Brief Lives*, where the author, writing of William Harvey, says of him that "All would allow him to be an excellent anatomist, but I never heard of any that admired his Therapeutique. I knew severall practisers in London that would not have given 3d. for one of his Bills; and that a man could hardly tell of one of his Bills what he did aime at." Can it be, after all, that even today science, like patriotism, is not enough and that medicine is incomplete without a lifegiving infusion of art?

But if this be obscurantism for all our professors, we must hope that some modest share in the education of our successors is left to those that have learned in the hard school of experience that there is art in medicine, who know what this means, and are thus best able to pronounce upon the place of art in medicine.

London, W.1. F. M. R. WAISHE.

SIR,—In Prof. Melville Arnott's oration (Oct. 15) there is the statement: "Medicine in all its activities must be a scientific discipline—that is, a compound of observation, deduction, and proof of validity of deduction." Like almost all statements, however unambiguous, this can be interpreted with several different shades of meaning, but it seems clear that in this context "Medicine" implies the practice of medicine, the use by doctors of their special skills and knowledge. A

scientific discipline could not be effective otherwise. Does our knowledge justify itself as scientific? Is not much of it mere belief, liable to be confounded sooner or later? Even in the unchanging field of human anatomy we find, according to your annotation, Sir, on p. 811 of the same issue, that established and accepted "facts" can be called in question.

If the statement is held to indicate only that doctors must make use of scientific methods there is little room for argument; we must and we do. But with what results? We are faced in any patient by factors which cannot be assessed or measured, "confronted," as Bridie put it, "with a concatenation of living, dying and functioning cells so complicated that it is impossible to understand the simplest of the processes involved . . . concatenations (which) are influenced arbitrarily by indefinable things called the will and the mind." Can a scientific discipline, however modified by "solicitude and compassion," cope with such a situation? Scientific method may suggest a course of action; the imponderable factors may be apparently irrelevant, but even if our treatment is successful it is nevertheless empirical; and the treatment of today may be included among the "absurd superstitions and revolting nostra" of tomorrow. Your leader [1] on thrombophlebitis after infusions might illustrate this point.

If science is knowing, and a scientific discipline a corpus of established knowledge, medicine, in my view, cannot be called a scientific discipline. As doctors we are subject, in part, to scientific discipline but this no more makes us scientists than military discipline makes National Servicemen field-marshals.

Falkirk. RONALD G. HENDERSON.

GENERAL PRACTICE

SIR,—I feel that Dr. Kempton's letter of Oct. 15 should not be allowed to pass without remark.

The one aspect of family doctoring which is performed most efficiently and with the minimum of fuss and ostentation is the follow-up of one's patients, although not many would consider it merited a separate department. It is a part of one's daily work which is done unobtrusively and regularly over the years as doctor and patients pass through the vicissitudes of life together, and no multiplication of hospital departments can replace it. It must not be assumed that because the family doctor, beset by his multifarious responsibilities, does not "complain about it very much" that he is not indignant at the attempts made to usurp him in his chosen specialty.

I have always, as do all good family doctors, turned to my consultant colleagues for advice in my difficult cases, and I have always referred to hospital patients requiring the help of the battery of mechanical aids to diagnosis at the disposal of the consultant; but I would never allow a hospital department or specialist to treat or follow up patients *for* me when the facilities for such treatment and follow-up were available to me. I agree that many consultants treat my patients *with* me, but that is a different matter altogether.

The causes of the crowded outpatient department are, of course, the inherent defects of the health service—the deliberate concentration of facilities and expenditure on hospitals, and the equally deliberate deprivation of the family doctor of facilities and starvation of funds for this, the most important and most abused part of the service. No improvement will result until provision is made for a general-practitioner service staffed by family doctors who have the means and skill necessary to collaborate closely with their colleagues in all other branches of the service.

The family doctor must be provided with his three main requirements—time, tools, and training. The original N.H.I. service gave a completely false impression of the number of patients who could be adequately looked after by one family doctor, since it was based on the healthiest part of the community. The National Health Service included children, elderly people, and wives in a much wider field of medical benefits, but the expenditure on the general-practitioner service was pegged down on the old N.H.I. basis. Our experience since 1948 shows that the general-practitioner's list should be quartered and his capitation fee quadrupled.

The family doctor should have not only "access to," but the enthusiastic and whole-hearted support of, a full range of secretarial and paramedical workers, whose help he himself coördinates. Secretaries, technicians, nurses, health visitors, physiotherapists, and trained medicosocial workers all come into this category.

The training of the family doctor must be realistically re-cast and re-orientated in the light of our experience of the trend of family doctoring in this country. This cannot be done without the creation of academic departments of general practice in all hospitals to deal with this super-specialty, and the making of provision for general practitioners to engage actively in research and investigation for general practice.

Given the necessary time, training, and equipment, the scope of general practice is limitless and the function of the family doctor will be completely different from that into which the N.H.I. and N.H.S. have forced him. Then, and only then, will the crowding of hospital outpatient departments be reduced to a proper proportion. The results which Dr. Kempton complains of are the end-product of official policy and until we can educate the politicians (and alas! many of our consultant colleagues) they will remain.

Reading. W. G. TAIT.

1. *Lancet*, Sept. 10, 1955, p. 541.

SMOKING AND THE HEART

SIR,—In your annotation last week you say "it is open to question whether the patient with coronary-artery disease who smokes moderately should be denied tobacco entirely." If it is open to question, surely we ought to discourage the taking of a risk by a patient with such a serious affection. The evidence you adduce seems to me strongly to support the view that stopping smoking may sometimes prevent coronary thrombosis.

One of the most dramatic recoveries I have seen was that of a man aged 58, almost in extremis for weeks following a severe coronary thrombosis. He admitted to inhaling 3 cigarettes per day. I prevailed on him to stop and his condition immediately improved He was soon up and about and lived quite comfortably for 2 years. He then died suddenly hurrying for a bus.

You attempt to justify your view—that patients with coronary-artery disease may sometimes be allowed 10–15 cigarettes per day (you do not stipulate that they should not inhale)—by saying that smoking "may afford solace to someone harassed by the burden of a serious disease." Such solace is obtained, I submit, at a great and, in my view, unjustifiable risk.

Wallasey, Cheshire. LENNOX JOHNSTON.

THE LUNGS IN MITRAL STENOSIS

SIR,—I was interested to read Dr. Short's letter of Oct. 15, referring to your leading article of Oct. 1.

He states that "a normal lung architecture is inconsistent with a diagnosis of severe mitral stenosis." This has not been my experience. Although severe pulmonary vascular changes, as demonstrated by radiology, are very common in patients with severe mitral stenosis, exceptions do occur when a tight valve is found at operation and a normal vascular pattern is shown on the chest film.

Nor can I agree with Dr. Short's assertion that the pulmonary vascular changes ascribed to mitral stenosis may sometimes be found in left heart-failure. I have never seen narrowing and tortuosity of the peripheral pulmonary arteries in patients with left ventricular failure.[1] In this group there is nearly always over-distension and over-filling of the peripheral vessels rather than under-filling.

1. Goodwin, J. G., Steiner, R. S., Lowe, K. G. *J. Fac. Radiol.* 1952, **4**, 1.

However, the small horizontal lines at the periphery of the lung in the lower zones, which are ascribed to distended lymphatics, are frequently seen in patients with pulmonary hypertension due to mitral heart-disease but also occur in patients with pulmonary hypertension due to other causes.

Hammersmith Hospital, London, W.12. R. E. STEINER.

CHILDREN'S APPETITES

SIR,—I should very much like to know what are the grounds for the widely held conviction that entirely healthy small children should not be allowed to satisfy their hunger (or should I put it "to eat as much as they want to eat"). Also what are the reasons for the implementation of this idea in English boarding-schools for boys between the ages of 6 years and 18 years?

London, S.W.1. R. M. DOWDESWELL.

VESICO-CŒLOMIC DRAINAGE

SIR,—I have read with great interest Mr. Mulvany's article of Oct. 8 on vesico-cœlomic drainage for the relief of ascites.

As Dr. Lewsen pointed out (Oct. 15), most cases of chronic ascites due to portal hypertension or malignant disease do not require diagnostic laparotomy. I also have successfully drained ascites by means of 'Polythene' tubing over a period of many weeks.

Size no. 2 tubing is introduced through a needle (S.W.G. no. 13) 3 in. long, which itself has been pushed through a sterile rubber disc from the screw-cap of a transfusion bottle. When the tip of the needle is inside the peritoneal cavity the polythene is introduced through the lumen of the needle up to a length of about 4 in. The needle is then withdrawn whilst the rubber disc is kept close to the abdominal wall. The rubber disc will grip the polythene tube firmly and serves as an anchor for 4 strips of adhesive plaster fixed to the abdominal wall. This device will hold the tube in position for many weeks without leak or sepsis and with no discomfort to the patient. At night the tube drains into a bottle at the patient's bedside, and in the case of ambulant patients into a rubber appliance fixed to the thigh, as used for urinary incontinence.

A similar technique in which polythene tubing replaces the needle can be used in the management of tension pneumothorax.

Liverpool. H. FULD.

GEOGRAPHICAL ASPECTS OF MELANOMA

SIR,—I have noted that the incidence of melanoma, as judged by deaths, appeared to be greater in Australia than in England, and that this might depend on solar radiation.[1] McGovern[2] explained the differences in age-incidence in his series from overseas by postulating that solar radiation might be important. He felt that this might also explain the relatively high melanoma-rate on the exposed parts of the body in his cases from a Sydney hospital. The pioneers in the study of skin cancer in Australia, E. H. Molesworth and N. Paul, had shown the importance of solar radiation in the production of the skin carcinomas but had not, apparently, considered it of importance in melanoma.

Australian statistics on melanoma date back to 1930. With the 6th revision of the *International List of Causes of Death*, statistics of melanoma are available for other countries for the years 1950 onwards. It is possible to give the deaths from melanoma per million persons per annum for the individual States in the years 1950 to 1953 as follows: Queensland 23, New South Wales 15, Western Australia 15, South Australia 12, Victoria 8, and Tasmania 8. For Australia as a whole, the rate is 14. The corresponding figures for England and Wales and for Scotland are 7 and 5 respectively.

The figures by State in Australia are of interest for they are in the same order as the capital cities as one passes from the tropical north to the south. The importance of such figures is strengthened by an analysis of the numbers of cases diagnosed histologically, the greatest number annually from any Melbourne hospital being 12, whereas the two largest Sydney hospitals each average about 40 cases annually.

Dr. A. G. S. Cooper, of the Queensland Radium Institute, has told me that for some years he has held the solar radiation to be an important factor and that the disease is more common in the northern parts of that State. He also believes that there are fewer cases of melanoma in Queensland, certified on the death certificates, than the spirit of the *International List* would require.

The experience of those who have had several years' tropical service in the British Armed Forces might well be compared with that of other appropriate British groups.

School of Public Health and Tropical Medicine, Sydney. H. O. LANCASTER.

TONSILLECTOMY WITHOUT TEARS

SIR,—Dr. Belfrage states in his letter of Sept. 17 that he offers himself as a target, by saying that he uses chloroform for the maintenance of anæsthesia in these cases for tonsillectomy in children. I do not propose to take up the challenge on this account, for I am quite sure that, in his hands, chloroform is an excellent anæsthetic.

I would, however, like to question his statement on "the waste of time that occurs when intubation is used with the addition of an unnecessary relaxant." My routine method of anæsthesia for Ts and As in children is now premedication with methylpentynol and atropine, induction with thiopentone followed by succinylcholine chloride, and nitrous oxide, oxygen, and trichlorethylene for maintenance with an endotracheal tube. The average time taken over each case from the insertion of the needle to the placing of the Boyle-Davis gag is 80 seconds.

When working with one surgeon who prefers an oral endotracheal tube, 5 cases are completed within the hour. For very young children who have "no veins" I use a barbiturate and atropine as premedication, with nitrous oxide, oxygen, and ether for induction, and maintenance, which naturally slows down the time taken over the case by several minutes. I am sure that Dr. Belfrage will admit that even in his experienced hands, and using chloroform instead of ether, that it is impossible to compete with the very rapid time that the use of a relaxant with endotracheal intubation makes possible; and that intubation gives greater control than when an insufflation technique is used.

I quite appreciate that speed is not the all-important factor in surgery, but long E.N.T. lists can become very tedious, both to the surgeon and to the anæsthetist as well as to the nursing staff.

Pietermaritzburg. J. D. M. BARTON.

Medicine and the Law

Appeal to Privy Council

Viscount Simond, Lord Keith of Avonholm, and Lord Somervell of Harrow on Oct. 24 heard the appeal brought by Dr. R. T. N. Simpson against the Medical Disciplinary Committee's finding that he had been guilty of infamous conduct and direction that his name be erased from the Medical Register.[1] Their Lordships, after consultation, and without calling on counsel for the committee, dismissed the appeal. They will put their reasons in writing.

1. Lancaster, H. O. *Med. J. Aust.* 1954, ii, 93.
2. McGovern, V. J. *Ibid*, 1952, i, 139.

1. See *Lancet*, 1955, i, 1172.

Obituary

NORMAN KLETTS

M.B. Manc., F.R.C.P.

Dr. Norman Kletts, a physician at the Manchester Royal Infirmary, died on Oct. 14 at the age of 60.

He entered Manchester University in 1912 as a Seton classical scholar, and after winning many prizes, medals, and scholarships he graduated M.B. in 1917 with distinction in medicine and surgery. He spent two years in the R.A.M.C., ending with a period as assistant bacteriologist to the Scottish Command based on Edinburgh. There his interest in pathology was aroused, and on his return to civilian life he became pathological registrar and assistant director of the clinical laboratory at the Manchester Royal Infirmary, working for a time under Prof. H. R. Dean. He took the M.R.C.P. in 1921 and in the same year became resident medical officer at the Infirmary—a post which he held with notable success for two years. By this time his reputation as a physician and his teaching ability were recognised.

He began consulting practice in 1923 while holding honorary appointments at Ancoats Hospital and Stockport Infirmary. Though neither of these was an official teaching hospital the students flocked to his clinics and ward-rounds. In 1934 he was appointed honorary physician to the Manchester Royal Infirmary and lecturer in medicine at the university. He was elected F.R.C.P. in 1944.

During the late war he undertook more and more civilian and hospital work, including the duties of dean of clinical instruction. In 1945 he broke down with pulmonary tuberculosis and underwent a thoracoplasty. By way of reablement he became adviser in medicine to the Oxford Regional Hospital Board and lived in the Cotswolds. He made such good progress that in 1949 he was able to return to his duties at Manchester, but he never returned to private practice. In its place he combined his work at the Infirmary with that of adviser in medicine to the Manchester Regional Hospital Board.

W. B. writes: "Kletts regarded pathology as the foundation of sound clinical medicine, and it was the basis of his teaching. It was not surprising that his practice was one of the largest in Manchester, for his manner, methods, and skill made him the ideal consultant for the general practitioner, patient, and relatives alike. In the last few years his best work was done for the regional hospital board, and the effective medical service which he has built up in the region will be his permanent memorial. He founded an active regional association so that his physicians could meet together to discuss their problems. They and those who came in contact with him, not least the medical students, will remember him for his excellent command of the English language, the clarity of expression which made his teaching so effective, and his intolerance of mediocrity. They will also recall his logical approach to a clinical problem. Wisely he lived out in the country in an old gamekeeper's lodge on the Adlington Hall estate looking on to the Derbyshire hills. His spare time was spent in his lovely garden. In the last few months his failing health had caused much anxiety. Even so his death came as a shock to his colleagues and friends."

Dr. Kletts leaves a widow and a daughter.

WILLIAM HAYWOOD HAMILTON

C.B., C.I.E., C.B.E., D.S.O., F.R.C.S.

Major-General W. H. Hamilton, a former director of medical services of the Indian Army, died on Oct. 18 at the age of 74 at St. Helier, Jersey.

He was the son of the late W. R. Hamilton of the Indian Civil Service, and he was educated at Tonbridge School and St. Bartholomew's Hospital. He played rugby and cricket for Barts and he was also far above the average as a tennis player. After qualifying in 1930 he held house-appointments at Barts and other London hospitals before he joined the Indian Medical Service in 1905. He held surgical and ophthalmic specialist appointments in the service till he became D.A.D.M.S. to the Lucknow division in 1911. Later he took part in the Abor expedition. In 1915 he was posted to Mesopotamia, and the next seven years were perhaps the most successful of a successful career. He went to Mesopotamia as a captain and D.A.D.M.S., and as the Force increased he remained senior staff officer to the head of the medical services. Of his work at this time a colleague writes:

"Hamilton had a pelmanistic memory, and kept in his head all the details of the medical organisation of the Force. He was thus invaluable to the series of senior men who filled the chief medical appointment. He had a gift for improvisation which was exactly what was needed in the early, gloomy days of the Mesopotamia Expeditionary Force. The powerful Mesopotamia Commission, which inquired into the medical scandals of 1916, though it took many scalps, left Hamilton unharmed."

He left Mesopotamia with the rank of lieut.-colonel, and the honours and decorations which he received for his services there included the C.I.E., C.B.E., D.S.O., and Corona d'Italia. He was also eight times mentioned in despatches.

After the 1914–18 war he took part in operations in Kurdistan and Persia before he returned to India, where he served on the North-West Frontier. Owing to his early brevet-colonelcy he found himself filling a series of acting posts as A.D.M.S. at Waziristan, Pindi, and Bombay, before he was appointed A.D.M.S. at Meerut in 1935. The following year he was promoted major-general and became D.D.M.S. to the Northern Command, India, and in 1940 he realised his chief ambition on his appointment as D.M.S. in India. He retired in 1941. From 1935 to 1941 he was honorary physician to the King.

A colleague writes:

"Haywood Hamilton was a versatile man. His chief gift was for administration and in this he had few equals. But he seemed to have no difficulty, when occasion arose, in turning to professional work and excelling in it. 'Hammy' could be ruthless. He neither courted nor achieved popularity, but he made a deep impression on all who met him, and mention of his name among people connected with India at any time in the last forty years immediately evoked a flood of stories and reminiscences."

WALTER HERBERT COLDWELL

M.B. Lond., F.F.R., D.M.R.E.

Dr. W. H. Coldwell died on Oct. 21 at the age of 63 years at Westminster Hospital, to which he was consulting radiologist.

Educated at Christ's Hospital, Horsham, he took his medical training at King's College, London, and Westminster Hospital. Soon after qualifying in 1916 he joined the Royal Navy and served in the Far East until the end of the 1914–18 war. He returned to Westminster for postgraduate studies, and his interest turned to radiology. This may have been a hereditary link, for his father had been one of the pioneer radiographers and his work for the new science later caused his death. Coldwell took the D.M.R.E. of the University of Cambridge in 1920 and was one of the first twelve men in the country to obtain this diploma.

From then on a busy private practice and hospital work occupied his time. From 1922 to 1934 he was one of the two radiologists to the Royal National Orthopædic Hospital. In 1923 he was appointed to the staff of the Westminster Hospital, and in 1939, when the new buildings were opened, and separate departments of radiodiagnosis and radiotherapy were created, he became physician in charge of radiodiagnosis. During the late war he held an appointment in the Emergency Medical Service, and was consultant in radiology to the R.A.F. These busy years taxed him severely and the end of the war saw him sadly reduced in health and strength. But though he retired from his hospital appointment he continued with his private practice until ill health forced his retirement in 1953.

F. M. A. writes: "Coldwell will always be remembered for his modesty and self-effacement. His practice was large and his opinion was widely called for, but he never sought the limelight. He believed that radiography was only an adjunct to diagnosis and not the sole answer. He refused to subscribe to the practice of drawing false assumptions from indifferent radiographs and would form his opinion only on those appearances which

fitted the pathology of the case and were demonstrable to the uninitiated on the beautiful radiographs, which, with skilled technical aid, he was so long able to produce."

JAMES DURNO CRUICKSHANK
M.D. Birm., D.T.M. & H.

Lieut.-Colonel Cruickshank, who was in charge of a military pathological laboratory in the Far East, was drowned on Oct. 22 while using an under-water breathing apparatus in the sea near Singapore.

Born in 1911, the son of the Rev. W. W. Cruickshank, he studied medicine at Birmingham University, where he graduated M.B. in 1934. The following year he joined the R.A.M.C. and he served in India from 1936 until 1945. During these years he was commanding officer of the 6th Indian field ambulance in India and Burma, and eventually became an A.D.M.S. Afterwards he became an Army specialist in pathology, and he later held specialist posts in Western Command and at the Chemical Defence Experimental Establishment at Porton. In 1947 he took the D.T.M. & H. and in 1954 the degree of M.D. At the time of his death, he was assistant director of pathology to the Far Eastern Land Forces. He was the only serving officer in the R.A.M.C. who had been graded as a senior specialist in both physiology and pathology.

H. C. writes: "James was a methodical and industrious worker with a keen and inquiring mind. He was a delightful colleague, quiet and self-effacing, yet with a dry humour which could be vastly entertaining. In 1946, he married Isabel Catherine, daughter of the late Sir John Ledingham, F.R.S., and it was always a joy to be entertained by them and their four lovely little daughters."

Dr. MARGARET JACKSON

R. S. P. writes:

Your admirable description of Margaret Jackson's personality seemed to some of her friends to miss what had become the real mainspring of her life—that joyful and indeed triumphant acceptance of Christian faith and of membership in the Anglican Church to which she had found her way.

Her upbringing was that of a liberal atheist but her humanitarian enthusiasm which you rightly emphasise led her, in maturity, to examine the claims of Christianity. She found in the Christian affirmations of Charity and Reconciliation a buoyant answer for both her mind and her heart. Already she had found ways to use her gifts to serve the Church and would have found others, all the more, perhaps, because she could take delight in the Church's tradition of music and drama.

M. C. N. J. writes:

"For years Margaret Nelson Jackson and I have been confused and often rolled into one person and now tragically I have lost my other and better half. The relationship of sister-in-law is not always easy, but though it would be ridiculous to say that two people with pronounced views never had any difference of opinion, I can say that I never came away from an argument, however heated, with Aunt Peg with anything but a pleasant taste. She could always see the other's point of view and invariably tempered her most forthright opinions with a nice humour. One of her most endearing qualities was an extreme tenderness of heart; she could not bear to see or hear of a creature suffering unduly, whether it was human or otherwise—her face would pucker in genuine distress and her instinct was to hold out a helping hand. As an aunt and a cousin she was matchless—no birthday was ever forgotten though the date chosen might bear little relation to the natal day; all her young relatives could be assured of her loving concern in their affairs and no matter was too small or trivial for her attention. As a family we are infinitely poorer without her; there is a wider family outside where her humanity and her wisdom and literary skill will be sadly missed."

Births, Marriages, and Deaths

BIRTHS

HUGHES.—On Oct. 15, at Goonpiper, Feock, to June, wife of Dr. E. B. Hughes—a daughter.

Notes and News

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE

A MEETING of the society at Manson House, London, on Oct. 20 was attended by Dr. Albert Schweitzer; and Prof. R. M. Gordon, the president, announced that Dr. Schweitzer had been invited to become an honorary fellow.

The President presented the Chalmers medal of the society to Dr. W. E. Kershaw, of the Liverpool School of Tropical Medicine; this medal is awarded biennially for distinguished work related to tropical medicine, the recipient being under 45 years of age.

In his presidential address Professor Gordon discussed the host-parasite relationship in filariasis. He recalled the state of knowledge of malaria when Manson was making his conjectures, based on the scanty information available over fifty years ago, and claimed that our knowledge of filariasis is now at about that stage.

The illustration used by Professor Gordon was *Loa loa*. At one time it was thought that this was a parasite of man only, carried by tabanid flies of the genus chrysops, but recent work has revealed a monkey reservoir, apparently little harmed by the infection. In the flies *Loa loa* finds a "good" intermediate host in that a high proportion of ingested microfilariæ reach the infection stage, to be passed on at a subsequent blood meal, and in that the fly takes its subsequent blood meal immediately after oviposition. (Professor Gordon defined a "good" host as one which allows a suitable proportion of the parasites to reach a stage of development most propitious for propagation of the species, such successful propagation generally depending on the parasite's ability to cause no serious injury to its host.) Although there is evidence that flies which have discharged their loads of infective filariæ may not live so long as uninfected flies, it is clear that the larvæ, in their migrations in the tissues of the flies, rarely damage vital organs. Chrysops must be regarded as a good host for loa.

The vertebrate host, man, behaves unevenly to his guest loa. Some human beings are bad hosts in that, although constantly exposed to infection, some fail to allow microfilariæ to appear in the blood in sufficient numbers, and therefore obstruct the biological cycle necessary to survival of the worm. They are ill-adapted hosts. But this does not appear to be true of *Acanthocheilonema perstans*, since in that harmless infection the presence of microfilariæ in the blood seems to be the rule. The bad human hosts of loa may be naturally ill-adapted from the outset but their power to suppress the appearance of microfilariæ may be enhanced by repeated infection. This conjecture is based on the observed fact that the older exposed Africans tend to show fewer microfilariæ than the younger people.

It therefore seems that the fly chrysops and certain species of monkeys are good hosts for loa, and that this association represents the normal and well-established cycle of development, man being in this respect a poor imitator of the monkey. We still know little of the essential relationship between the worm and man, and until further research has been carried out our understanding, and therefore the development of rational methods for treatment and control, will remain inadequate.

C.I.O.M.S.

THE Council for International Organisations of Medical Sciences held its 3rd general assembly in Paris on Sept. 30 and Oct. 1 under the chairmanship of Prof. R. E. Tunbridge, professor of medicine in the University of Leeds. The council was founded in Brussels in 1949, under the joint auspices of UNESCO and the World Health Organisation, and its object is to facilitate the spread of knowledge in such ways as to promote advances in medical science and to encourage the utilisation of such knowledge throughout the world.

The assembly reviewed the present-day problems of communication between doctors. They re-examined the real functions of international congresses in the light of the changed situation brought about by specialisation and the increased output of scientific research in various fields. On the one hand, the more general congresses were becoming too large and, what was worse, the number of papers read too great; opportunities for real discussion were all too rare. On the other hand, specialisation tended to increase the number

of meetings, and these specialised meetings often lost contact with their parent disciplines. As international congresses were not the media for reporting scientific discoveries, it was agreed that much could be done to improve the opportunities they offered for personal contacts, for disseminating information to a wide international audience, and for arranging international symposia and other satellite activities.

Symposia were defined as carefully prepared meetings at which 15 to 20 specialists representing various branches of science gathered for several days to discuss a clearly defined subject in private or before a small invited audience. They could be held independently but it was a good thing to hold them several days before a congress, so that a rapporteur could bring to the larger audience of the congress the conclusions of the smaller group. Special symposia could also be organised in countries in the process of development, and they were an excellent way of stimulating research, and thus leading, in the long run, to the better practice of medicine.

Discussing written communications, the assembly agreed that there was much duplication between indexing and abstracting services. There were considerable difficulties in achieving over-all coördination, but action of limited scope should be undertaken whenever opportunities arose. Standardisation of terminology was an important activity that the council would continue to encourage, as it had done in the case of anatomy.

The assembly decided to promote through the councils' membership a clearer recognition of present-day functions of international congresses; a flexible coördination of congresses of related disciplines; a shift from individual participation to group participation through pre-congress working parties and symposia, or by the appointment of experts to make digests of related communications; a greater participation of young research-workers; and the holding after a congress of special international courses for the host country, in particular cases.

It was decided that the council should continue its policy of organising symposia on general subjects or specially important areas of research, and stimulate the organisation of the pre-congress symposia already mentioned and of scientific meetings in underdeveloped countries.

COÖPERATION IN THE NATIONAL HEALTH SERVICE

AT the annual conference of the Executive Councils' Association at Brighton on Oct. 21, Mr. Iain Macleod, the Minister of Health, discussed coöperation between the various bodies administering the National Health Service and the people working in it.

He welcomed the British Medical Association's action in asking local medical committees to coöperate with medical officers of health in ensuring that family doctors were able to play their full part in helping to prevent the break-up of families. There had, he continued, been a great development of group practice. By the end of August there were 169 applications for interest-free loans for the provision of premises for group practices, and the amount of money involved had grown to £286,000; the scheme had been so popular that the amount of money asked for was considerably in excess of that available.

Mr. Macleod said he would like to see more part-time hospital appointments held by general practitioners. Hospitals should welcome family doctors not only at clinical meetings, but also in the wards to see their own patients. Hospitals could help family doctors by providing them with the services of the pathological and X-ray departments. In return general practitioners could help the hospitals by giving full reasons why they referred their patients to hospital.

Another valuable link was the domiciliary consultant service, which had grown from just under 60,000 patients visited five years ago to 224,000 visited last year.

Many medical officers of health were working for close association between their staff and the family doctors, and in many areas there were now small informal committees whose job it was to ensure that this team-work was encouraged. Mr. Macleod was not satisfied that there was, as yet, close coöperation in the maternity service by the hospitals, general practitioners, and local health authorities, especially in antenatal care. More should be done to strengthen the link between the family doctors and the non-medical social workers and to bring these workers into the team of which the doctor was the leader.

It was important that local authorities should integrate their own domiciliary, health, and welfare workers so that they could work together as a team, and one way of achieving this was to have them under a single direction. Many workers might be concerned in a single case, and commonly they went into action without having first worked out a coördinated plan; this tended to "departmentalise" the family. Efforts were being made in some areas to bring the family doctor into case-conferences, and he was sure that this was of the greatest value.

Mr. Macleod said that pilot schemes to show the beneficial effects of the fluoridation of water-supplies for the prevention of caries, particularly among children, were being arranged in 2 centres in England, 1 in Wales, and 1 in Scotland, with the full support of the British Dental Association and the Royal College of Surgeons. Local health authorities had been asked to give a much bigger place to dental health education by health visitors and other officers. Of the Dentists Bill now before Parliament, Mr. Macleod said that one of the main purposes was to recognise "the full maturity of the dental profession by granting it the privilege of self-government." Another purpose was to allow the dental profession to make use of ancillary help, subject to suitable safeguards.

HEREDITY AND ENVIRONMENT

ARE large families injurious to the human stock, and is heredity a more important factor than environment in human intelligence and progress? These questions were discussed by Prof. L. S. Penrose, F.R.S., in this year's convocation lecture of the National Children's Home.[1] Professor Penrose points out that "there is a great fear, among eugenists, that, owing to a tendency for size of family to be inversely related to the intelligence test scores, both of parents and of offspring, a decline of average ability is in progress." An investigation by the Scottish Council for Research in Education in 1947 confirmed that low intelligence-quotients were found in large families, but it showed a general rise in children's intelligence, which was attributed by one authority to improved environment. Eugenists also claim that improved standards of living and medical science are harming the human stock by allowing the survival of weaklings who would perish under natural selection.

Professor Penrose takes the opposite view, maintaining that it is quicker and easier to improve the human stock by changing the environment than by attempting to improve the genes by selective breeding. "We do not try and breed out people who are short-sighted or astigmatic, for example: we correct their vision with spectacles. The cure takes a few weeks instead of a few thousand years." A population growing under adverse conditions, he says, is selected so that the formation of genes specially helpful in the particular adversity is encouraged; and, although this may be helpful against the hazard, it may be deleterious to the population in general. For instance, the sickle-cell trait has probably been developed genetically in Africans to resist malaria, but it causes severe anæmia. Malaria control will eventually improve the human stock by making the sickle-cell trait unnecessary; hygienic measures of this kind are therefore eugenic and not dysgenic.

Professor Penrose is optimistic about the future of the human stock, and declares that our hereditary constitution makes us change our environment. "Hence the gain in stature of children, in length of life and in general health which has taken place in the last hundred years is not really environmentally determined but based upon heredity."

HOSPITALS IN NORTHERN IRELAND

THERE was an increased demand on the hospital and specialist services in Northern Ireland in 1954 compared with the previous year, and overcrowding in mental hospitals was complicated by the shortage of specialised nurses.[2] (On the other hand, the general establishment of nurses increased from 3516 in July, 1948, to 5277 at the end of 1954—a rise of just over 50%.) The department of social and preventive medicine at Queen's University, Belfast, forecast an increase of 14% in the admission of elderly people to mental hospitals within the next ten years.

1. Heredity and Environment in Human Affairs. By L. S. PENROSE, M.D., F.R.S. Published by the National Children's Home, Highbury Park, London, N.5. Pp. 23. 1s.
2. Seventh annual report of the Northern Ireland Hospitals Authority. H.M. Stationery Office. Pp. 199. 3s. 6d.

To meet these increased demands, two new hospitals are being built at Londonderry, one of which, together with a colony being built at Muckamore, will be for mental patients. Many additions to existing hospitals were made during 1954, including new units, outpatient departments, and wards. The Duchess of Gloucester opened a new infants' ward in the Ulster Hospital for Children and Women in October, 1954, and Dame Dehra Parker, the minister of health and local government, opened a new unit of the Holywell Mental Hospital the following month. Despite a general rise in admissions, one hospital reduced its waiting-list during the year from 498 to 260.

Following a debate on the health services in the Northern Ireland House of Commons early in 1954, the Hospitals Authority set up a committee, which received reports from hospitals as well as 400 general practitioners, and later suggested ways in which the health service could be improved. Among the committee's recommendations were methods for reducing waiting-lists, avoiding delay in patients' admission, and improving the appointments system in outpatient departments.

During the year the clinical pathological laboratory in Belfast made a survey of the incidence of *Staphylococcus aureus* in the hospital population. The report notes "with some misgiving" that there was an increase in the number of strains resistant to both penicillin and the wide-spectrum antibiotics such as aureomycin, oxytetracycline, and tetracycline. Over 60% of the cultures of *Staph. aureus* taken from inpatients and outpatients of the Tyrone County Hospital, Omagh, were found to be penicillin-resistant.

ANALGESIA IN DOMICILIARY MIDWIFERY

IN a report and memorandum submitted to the National Birthday Trust Fund, Mr. William Penman, a deputy chairman of the Trust, analyses domiciliary confinements in 1954 according to the proportion of cases in which analgesia was provided. In his report he remarks that the proportion of cases where a doctor was booked increased from 61·1% in 1953 to 68·7% in 1954. On the other hand, the proportion of cases were a doctor was actually present at the delivery fell slightly from 20·7% in 1953 to 20·2% in 1954. In 1954 the proportion of cases where analgesia of some sort was provided was about 83%. Nitrous oxide was administered in 72% of confinements; but of the 146 administrative units in the country there were still 13 where nitrous oxide was administered in less than 51% of confinements.

MEDICINE BOTTLES

THE Ministry of Health has this week launched a campaign for the return of empty bottles used for dispensing medicines under the National Health Service. The Ministry points out that some 100 million bottles are used every year, but most of them do not find their way back to the chemist; and great saving will be made if patients will return them to their chemist, having first washed them in hot, soapy water.

EXHIBITION OF MEDICAL PHOTOGRAPHY

AN exhibition of medical photography presented by the medical group of the Royal Photographic Society was opened in London on Oct. 17. This includes a series of panels illustrating the function and scope of illustration departments in hospitals, with the object of showing some of the ways in which photography may be applied to teaching, recording, illustrating, and research.[1] Beside these panels are two novel visual aids enabling medical students to view slides and ciné films in miniature projectors. Slides are arranged in magazines and are projected on to a ground-glass screen in a special viewer; the looped films may be started by pressing a switch, the projector being switched off automatically when the loop has passed completely through the machine once. The selection of prints submitted by members for inclusion in the exhibition was based, not only on the photographic quality of the work, but on its value for illustrating the feature which it is intended to show. Probably many of the photographs exhibited form part of a visual unit—for instance, the excellent pictures showing the surface anatomy of muscles, which should be accompanied by explanatory diagrams naming the muscles shown. The exhibition also includes colour transparencies.

This exhibition, at the Royal College of Surgeons, Lincoln's Inn Fields, W.C.2, closes today, Saturday, Oct. 29. It will be on view at the Littlewood Hall, Leeds General Infirmary, from Nov. 20 to Dec. 2.

1. See also *J. Photogr. Sci.* 1955, **3**, 51.

University of Oxford

On Oct. 13 the following degrees were conferred:

B.M.—R. G. Bannister, David Staig.

University of Cambridge

On Oct. 15 the following degrees were conferred by proxy:

M.B., B.Chir.—D. N. Whitmore, G. W. Phipps.
M.B.—E. F. D. Gawne, K. P. Goldman, Mary G. Kemp, R. E. Nagle.

University of Leeds

Mr. A. V. Pollock has been appointed lecturer in surgery, and Mr. W. N. Wild lecturer in anæsthetics. The title of emeritus professor has been conferred on Prof. R. A. Willis on his retirement from the chair of pathology.

University of Sheffield

The following appointments have been made: Mr. W. J. W. Sharrard and Mr. F. W. Taylor, clinical teachers in orthopædic surgery; Dr. D. MacVicar, honorary tutor in obstetrics and gynæcology; Dr. R. C. Curran, senior lecturer in pathology; Dr. D. H. Blakey, lecturer in obstetrics and gynæcology; Mr. B. N. Catchpole, lecturer in surgery; and Dr. I. M. Baird, part-time lecturer in pharmacology.

University of Dundee

On Oct. 12 the degree of M.D. was conferred in absentia on D. A. Kerfoot.

Royal College of Physicians of London

On Oct. 18 the Baly medal was presented to Prof. A. L. Hodgkin. The following extract is taken from the citation:

"Professor Hodgkin is awarded the Baly medal for his work on the initiation and conduction of nervous impulses. He has shown that rare combination of originality of thought, experimental ingenuity and manipulative skill which characterises the pioneer in scientific investigation. . . . Not the least of Professor Hodgkin's rights to recognition is the stimulating effect he has had on other workers, particularly on the group of collaborators he has attracted to him, who are worthily maintaining the great reputation of the Cambridge School of Electrophysiology."

Royal College of Surgeons of Edinburgh

At a meeting of the college on Oct. 19, with Prof. Walter Mercer, the president, in the chair, the following were admitted fellows:

Abdul Salam Al-Attar, W. H. Bain, J. V. Bryer, Suhail Daud Bulos, Ghafoor Ahmad Burney, Saktidas Chatterjee, Vinoobhai Mathuradas Cholera, J. E. Devitt, R. E. Gristwood, Byranna Hanumaiah, Abdul Majid Bin Ismail, Leslie Linder, G. E. Mann, A. T. Marshall, T. W. Milliken, P. W. Mitchell, A. J. G. Nicholson, Bernard Nolan, J. A. Pratt-Johnson, J. A. E. Primrose, W. D. Roberts, Jagdish Narayan Rohatgi, E. F. B. Rose, Azmy Sadek, H. R. Schaeffer, Balwant Kashinath Shenolikar, D. H. Walker, F. C. Walker, C. C. Wiggishoff, R. P. Yaxley.

At the annual meeting of the college held on the same day the following office-bearers were elected for the coming year:

President, Prof. Walter Mercer; vice-presidents, Prof. R. C. Alexander and Mr. John Bruce; secretary, Prof. George Scott; treasurer, Mr. J. J. Mason Brown; president's council, Mr. David Band, Prof. Norman Dott, Mr. Andrew Fowler, Mr. J. N. J. Hartley, Sir James Learmonth, Prof. W. A. Mackey, Prof. Bryan McFarland, Dr. David Middleton, Mr. T. McWalter Millar, Dr. Douglas Miller, Mr. R. Leslie Stewart, Mr. Robert Stirling, and Mr. Robert Withers; representative on the General Medical Council, Mr. K. Paterson Brown; conservator of museum, Prof. D. E. C. Mekie; convener of museum committee, Mr. John Bruce; and hon. librarian, Dr. Douglas Guthrie.

Royal College of Obstetricians and Gynæcologists

On Friday, Nov. 25, at 5.30 P.M., Mr. Arthur Sutherland will deliver the William Blair-Bell lecture. His subject will be Tuberculosis of the Endometrium. Tickets may be had from the secretary of the college, 58, Queen Anne Street, London, W.1.

Society of Apothecaries

On Oct. 19 the society entertained to luncheon the six Russian doctors now visiting this country at the invitation of the British Medical Association. Dr. Macdonald Critchley, senior warden, welcomed the guests in Russian; and Prof. G. F Gause, deputy director of the Institute of Research for New Antibiotics, Academy of Medical Sciences of the U.S.S.R., replied in English. Dr. Neville Finzi, Master of the society, explained to the visitors some of the chief events in the society's long history. The company included Sir Cecil Wakeley (immediate past Master), Sir Charles Dodds, F.R.S. (a past Master), Sir Arthur Porritt, Mr. T. B. Layton (a past Master), Dr. Reginald Fisher (junior warden), Dr. Bernard Myers, and Dr. Ian Grant (chairman of the representative body of the B.M.A.).

Wiltshire Research Scholarship in Cardiology

This scholarship, which was founded to encourage research in cardiology and may be used for study and travel abroad, is now vacant. It carries an honorarium of at least £400 a year. Further particulars may be had from the Dean of King's College Hospital Medical School, Denmark Hill, London, S.E.5.

Antarctic Expedition

The advance party of the Royal Society International Geophysical Year Expedition sails for Antarctica on Nov. 22. The commander of the expedition is Surgeon Lieut.-Commander David Dalgliesh, R.N., who has been released from his medical duties at a Royal Naval Hospital.

Harold Waller Unit

When the late Dr. Harold Waller retired from his post as pædiatrician to the British Hospital for Mothers and Babies, Woolwich, which he had held since 1913, a fund was launched to commemorate him and his work. With the £2500 soon collected, a flat of two bed-sitting rooms, bathroom, and sun balcony was built for mothers and their babies, from any district, who run into feeding or management difficulties which require special supervision. This unit was officially opened on Oct. 20 by Sir Eardley Holland.

Law on Homosexuality

The recommendation by the council of the Magistrates' Association that homosexual conduct in private between consenting adults, aged 30 or more, should no longer be a criminal offence except where a mentally defective person is concerned (see *Lancet*, Oct. 8, 1955) was rejected at the association's annual meeting by 256 votes to 91 (*Times*, Oct. 22).

Diary of the Week

OCT. 30 TO NOV. 5

Tuesday, 1st

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.2
5 P.M. Mr. J. G. Sandrey: Urethral Obstruction in the Adult Male.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8.30 P.M. *Orthopædics.* Prof. R. I. Harris (Toronto): Fat Embolism.

ST. MARY'S HOSPITAL MEDICAL SCHOOL, Paddington, W.2
5 P.M. Dr. Louis Steingold: Anæmia During Pregnancy, Labour, and the Puerperium.

INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5.30 P.M. Prof. C. A. Keele: Physiology of Sweating.

INSTITUTE OF NEUROLOGY
5.30 P.M. (National Hospital, Queen Square, W.C.1.) Dr. J. St. C. Elkington: Migraine.

SOCIETY OF APOTHECARIES OF LONDON, Black Friars Lane, E.C.4
4.30 P.M. Mr. Bernard Schlesinger: Modern Advances in Pædiatrics.
5.45 P.M. Mr. Denis Browne: Surgical Aspect of Pædiatrics.

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.) Prof. M. M. Swann: Physiology of Mitosis.

ROYAL ARMY MEDICAL COLLEGE, Millbank, S.W.1
5 P.M. Mr. P. M. Gunning: The British Murderer.

Wednesday, 2nd

ROYAL SOCIETY OF MEDICINE
5.15 P.M. *History of Medicine.* Lieut.-Colonel D. McDonald: History of the Indian Medical Service.
8 P.M. *Surgery.* Dr. I. Douiach, Mr. J. E. Piercy, Dr. E. E. Pochin: Carcinoma of the Thyroid.

POSTGRADUATE MEDICAL SCHOOL OF LONDON, Ducane Road, W.12
2 P.M. Dr. J. D. N. Nabarro: Diabetes and Carbohydrate Metabolism.

INSTITUTE OF DISEASES OF THE CHEST, Brompton Hospital, S.W.3
5 P.M. Dr. J. Clifford Hoyle: Spontaneous Pneumothorax.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. R. W. Riddell: Pathogenesis of Tinea Capitis.

ST. MARYLEBONE HOSPITAL FOR PSYCHIATRY AND CHILD GUIDANCE, 48, Cosway Street, N.W.1
5.30 P.M. Dr. R. D. Newton: Organic Pathology and Mental Disease.

ROYAL INSTITUTE OF PUBLIC HEALTH AND HYGIENE 28 Portland Place, W.1
3.30 P.M. Prof. F. R. G. Heaf: Tuberculosis in Geriatrics.

MIDLAND MEDICAL SOCIETY
8.15 P.M. (154, Great Charles Street, Birmingham, 3.) Sir Geoffrey Jefferson, F.R.S.: Sleep and Stupor.

NOTTINGHAM MEDICO-CHIRURGICAL SOCIETY, 64, St. James's Street, Nottingham
8.30 P.M. Dr. C. Keith Simpson: Foul Play.

MANCHESTER MEDICAL SOCIETY
4.30 P.M. (Medical School, University of Manchester.) *Medicine.* Dr. S. P. Meadows: Clinical Aspects of Optic Nerve Compression.

ROYAL FACULTY OF PHYSICIANS AND SURGEONS, 243, St. Vincent Street, Glasgow, C.2
5 P.M. Mr. R. B. Wright: Peripheral Vascular Disease—the Veins.

Thursday, 3rd

UNIVERSITY OF LONDON
5 P.M. (1, Wimpole Street, W.1.) Lord Adrian, O.M., F.R.S.: Action of the Mammalian Olfactory Organ. (Semon Lecture.)

ROYAL COLLEGE OF SURGEONS OF ENGLAND
3.30 P.M. Dr. M. H. Armstrong Davison: Ut non Percipiatur Dolor. (Frederic Hewitt Lecture.)
3.45 P.M. Prof. Gilbert Causey: Mechanism of Respiration.

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. Dr. H. G. Davies: Use of the Interference Microscope in Biological Research.

SOCIETY OF APOTHECARIES OF LONDON
4.30 P.M. Sir Horace Evans: Medical Aspect of Peripheral Vascular Disease.
5.45 P.M. Sir James Paterson Ross: Surgical Aspect of Peripheral Vascular Disease.

UNIVERSITY OF ST. ANDREWS, Queen's College, Small's Wynd, Dundee
5 P.M. Prof. J. H. Dible: Hepatitis and Other Problems in the Liver.

Friday, 4th

UNIVERSITY OF LONDON
5 P.M. (Charing Cross Hospital Medical School, W.C.2.) Mr. John Hammond, F.R.S.: Growth in Animals.

POSTGRADUATE MEDICAL SCHOOL OF LONDON
2 P.M. Prof. Lambert Rogers: Surgery of the Carotids.
5 P.M. Dr. J. F. Goodwin: Mitral-valve Disease.

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, 330, Gray's Inn Road, W.C.1
3.30 P.M. Mr. Charles Heanley: Fractures of the Nose and Jaw.

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
4.30 P.M. (Queen Charlotte's Hospital, Goldhawk Road, W.6.) Mr. W. Hawkesworth: The Occipito-posterior Position.

ROYAL SOCIETY OF MEDICINE
10.30 A.M. *Otology.* Mr. E. G. Collins: Preservation and Restoration of Function in Otology. (Presidential address.)
2.30 P.M. *Laryngology.* Mr. W. A. Mill: Cancer of the Larynx: Laryngectomy after Radiotherapy. (Presidential address.)
5.30 P.M. *Anæsthetics.* Dr. T. Cecil Gray: A Retreat. (Presidential address.)

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. M. Feiwel: Occupational Dermatitis.

UNIVERSITY OF EDINBURGH, University New Buildings, Teviot Place, 8
5 P.M. Dr. J. S. Robson: Physiological and Therapeutic Control of Total Body Sodium. (Honyman Gillespie lecture.)

Saturday, 5th

INSTITUTE OF LARYNGOLOGY AND OTOLOGY
11 A.M. (Royal National Throat, Nose and Ear Hospital, Gray's Inn Road, W.C.1.) Dr. André Soulas, Dr. Dubois de Montreynaud (Paris): Colour Illustrating Bronchoscopy and Œsophagoscopy. (Film.)

Appointments

BOSTOCK, A. D., M.B. Manc.: school M.O., Manchester.
COUNSELL, P. B., M.S. Lond., F.R.C.S.: consultant surgeon, Ipswich and East Suffolk hospital group.
DALY, B. G., M.B. Edin.: whole-time senior asst. psychiatrist, Bracebridge Heath Hospital, Lincoln.
NICHOLSON, D. F., M.B. Edin.: appointed factory doctor, Falkirk.
PEPYS, JACK, M.B. Witw'srand, M.R.C.P.: clinical asst., allergy clinics, Wright-Fleming Institute of Microbiology, St. Mary's Hospital, Paddington.
RAPER, JOYCE, A. M.B., D.P.H.: school M.O., Manchester.

Colonial Appointments:

BAKER, C. H. A., M.R.C.S., D.P.H.: administrative M.O., Federation of Malaya.
BELCOURT, C. L., M.B. Lond: M.O., Mauritius.
BERMAN, A. J., M.R.C.S.: M.O., northern region, Nigeria.
CHIA AH KWAN, M.B.: M.O., Singapore.
COLE, A. C. E., M.D. Camb., F.R.C.P., D.M.R.D.: senior specialist, Tanganyika.
COMISSIONG, L. M., M.B. Edin., D.T.M. & H.: D.D.M.S., Trinidad.
COORE, L. D., M.B. Durh., D.P.M.: medical specialist, Jamaica.
KHAKOO, M. M., M.B.: R.M.O. (intern), Uganda.
LALLAH, P., M.B.: M.O., Mauritius.
LOMEZ, J., M.B., F.F.A.R.C.S.: specialist officer (anæsthetist), Federation of Malaya.
MCCRORIE-LALTOO, J., M.B.: M.O. (intern), Trinidad.
MCKNIGHT, R. F., M.R.C.S.: M.O., Kenya.
MACNAMARA, O. D., M.B. Camb., D.M.R.D.: specialist (radiologist), Federation of Nigeria.
OLIVEIRO, F. X., L.R.C.P.E.: administrative M.O., Federation of Malaya.
PECKOVER, J. R. B., M.B. Lond.: M.O., Kenya.
PHILLIPS, P. M. J., M.R.C.S.: senior M.O., Gold Coast.
ROSEVERNE, V., M.B. Polish Sch. of Med., Edin.: specialist radiologist, Federation of Malaya.
SARAVANAMUTHU, M.: administrative M.O., Federation of Malaya.
TEN, YOON FONG, L.M.S. Singapore Med. Coll.: administrative M.O., Federation of Malaya.
THETHRAVUSAMY, J. A., M.B. Madras: M.O., Zanzibar.
VAN DER KOLFT, N., M.D. Leyden: M.O., northern region, Nigeria.

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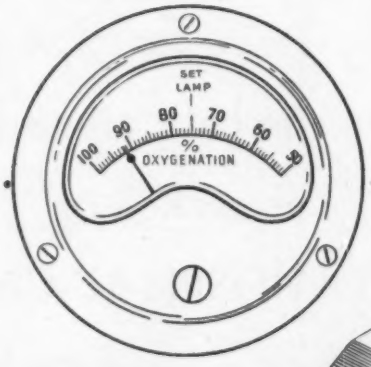

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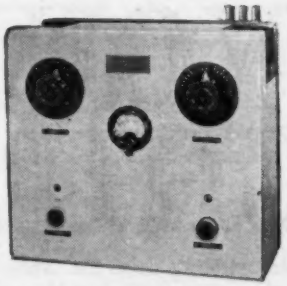

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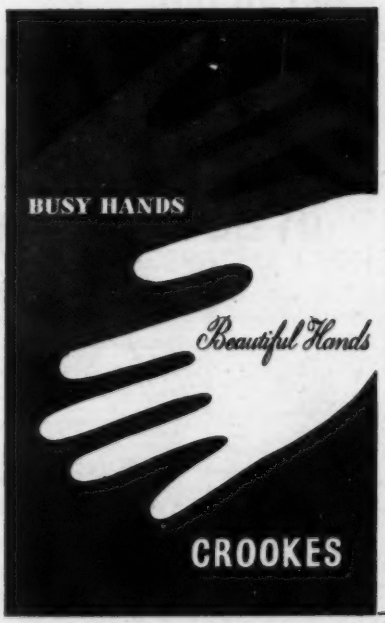

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The Terms and Conditions of Service of Hospital Medical and Dental Staff apply to all N.H.S. hospital posts we advertise, unless otherwise stated. Canvassing disqualifies but candidates may normally visit the hospital by appointment.

Academic and Educational

ROYAL COLLEGE OF PHYSICIANS OF LONDON

The next EXAMINATION for the MEMBERSHIP will commence on WEDNESDAY, 28TH DECEMBER, 1955.

Prospective candidates are asked to note that entries accompanied by the certificates, testimonials and the Examination fee of 15 guineas as required by the by-laws, must reach the College not later than first post on Wednesday, 30th November, 1955. Candidates must have been qualified for 18 months.

Candidates who propose to submit Published Work under the regulations are required to give 28 days notice, and should apply in writing to the Registrar, without delay, for detailed instructions as to the procedure they should follow. Completed entries for Published Work must also reach the College not later than first post on Wednesday, 30th November, 1955.

HAROLD BOLDERO, D.M., Registrar.

12, Pall Mall East, London, S.W.1.

ROYAL COLLEGE OF PHYSICIANS OF LONDON

DENIS WILLIAMS, Esq., C.B.E., M.D., D.SC., F.R.C.P., will deliver the BRADSHAW LECTURE on THURSDAY, 10TH NOVEMBER, 1955, at 5 P.M., at the College, Pall Mall East, S.W.1.

Subject: "Emotions Arising in Epileptic Attacks."

Any member of the Medical Profession admitted on presentation of card.

By order of the President,
HAROLD BOLDERO, Registrar.

ROYAL COLLEGE OF SURGEONS OF ENGLAND

PROPHIT RESEARCH STUDENTSHIPS

2 candidates will be nominated by the Council of the Royal College of Surgeons of England in JANUARY next for Prophit Studentships in Cancer Research.

The value of the Studentships will be £800 p.a., with an allowance not exceeding £200 for expenses and will be for 1 year from 1ST JANUARY, 1956, in the first instance, but renewable annually up to 5 years at the discretion of the Special Trustees on the nomination of the Council of the College.

At the Royal College of Surgeons there are specific openings for suitable candidates, to work:—

(1) in the Department of Anatomy on the problems of cell growth, particularly from the electron microscopic and quantitative aspects.
(2) in the Department of Pathology on problems of the origin and spread of lung cancer.

Applications, accompanied by a recommendation from a member of the staff of the applicant's Medical School or University, should be sent to the Secretary, Royal College of Surgeons, Lincoln's Inn-fields, W.C.2, before 12th December, 1955.

KENNEDY CASSELS, Secretary.

UNIVERSITY OF LONDON
INSTITUTE OF ORTHOPÆDICS

COURSE IN NEUROLOGY IN ORTHOPÆDICS
28TH NOVEMBER–2ND DECEMBER, 1955

Monday, 28th November—Town Section	
Electrical examination in neuro-muscular disorders	Mr. D. M. BROOKS
Spina bifida	Mr. J. I. P. JAMES
Some deformities associated with neurological disorders (1)	Dr. P. H. SANDIFER Mr. J. I. P. JAMES
Pathology of poliomyelitis	Dr. H. A. SISSONS
Tuesday, 29th November—Town Section	
Some deformities associated with neurological disorders (2)	Dr. P. H. SANDIFER
Traumatic paraplegia	Dr. L. GUTTMANN
Cerebral palsies of infancy (1)	Dr. P. H. SANDIFER
Wednesday, 30th November—Town Section	
Pathology of muscle	Dr. H. A. SISSONS
Cervical disc lesions	Mr. H. O. CLARKE
Cerebral palsies of infancy (2)	Dr. P. H. SANDIFER
Nerve injuries at the wrist	Mr. H. J. SEDDON
Pathology and diagnosis of intervertebral disc lesions	Mr. H. J BURROWS.
Thursday, 1st December—Country Section	
Poliomyelitis—early treatment	Mr. D. M. BROOKS
Surgery of spastic paralysis	Mr. K. I. NISSEN
Compression paraplegia	Mr. V. LOGUE
Friday, 2nd December—Country Section	
Poliomyelitis—late treatment	Mr. J. A. CHOLMELEY
Clinical demonstration	Mr. D. TREVOR
Nerve injuries complicating fractures	Mr. H. J. SEDDON

The fee for this course (including lunch and tea) is 7 guineas. Early application should be made to the Dean, at 234, Great Portland-street, London, W.1.

UNIVERSITY OF LONDON

A LECTURE on "Growth in Animals" will be given by Dr. J. HAMMOND (Cambridge) at 5 P.M., on 4TH NOVEMBER at Charing Cross Hospital Medical School, Chandos-place, W.C.2.

Admission free, without ticket.

JAMES HENDERSON, Academic Registrar.

ST. MARY'S HOSPITAL MEDICAL SCHOOL

LEVERHULME RESEARCH FELLOWSHIPS

Applications from Graduates in Medicine or Science are invited for 3 Leverhulme Research Fellowships of a value of £800–£1000 p.a. The Fellowships will be for a period of a year renewable up to 3 years and may be held in any pre-medical, pre-clinical, or clinical department of the Medical School.

Applications (in duplicate), stating age, qualifications, experience, and a brief outline of the research work proposed, together with the names of 2 referees, should reach the Secretary, St. Mary's Hospital Medical School, Paddington, W.2, not later than 26th November.

UNIVERSITY OF LONDON

GRANTS FOR RESEARCH

Applications are invited from members * of the University and teachers in Schools of the University for grants from the Central Research Fund to assist specific projects of research and for the provision of special materials and apparatus. Grants are not made for normal maintenance.

Applications must be received not later than 30th November, 1955. Forms of application and further particulars may be obtained from the Secretary to the Central Research Funds Committee, University of London, Senate House, London, W.C.1.

* Members of the University are defined by Statute as the Chancellor, the members for the time being of the Court and of the Senate respectively, the Professors and Readers and other Teachers of the University during their tenure of office, the graduates and the students.

UNIVERSITY COLLEGE LONDON
(Gower-street, W.C.1)

4 LECTURES by Dr. R. J. P. WILLIAMS (University of Oxford) entitled "Metal Complexes as Models for Metallo-Enzymes" will be given on THURSDAYS, 17TH, 24TH NOVEMBER, 1ST, 8TH DECEMBER, at 5 P.M.

Admission free, without ticket.

E. A. L. GUETERBOCK, Secretary.

KETTLE MEMORIAL LECTURE

The KETTLE MEMORIAL LECTURE, entitled "Ischæmia in the peripheral circulation," will be delivered by Prof. J. H. DIBLE, Postgraduate Medical School of London, on FRIDAY, 2ND DECEMBER, 1955, at 5 P.M., in the Institute of Pathology, Royal Infirmary, Cardiff.

INSTITUTE OF BASIC MEDICAL SCIENCES. Applications are invited for the full-time posts of:—

(1) SENIOR LECTURER IN BIOCHEMISTRY.
(2) SENIOR LECTURER/LECTURER IN PATHOLOGY.
(3) LECTURER IN PHYSIOLOGY.

The successful candidates will be expected to take part in the teaching activities of the departments. Facilities for research are available in the laboratories of the Departments and also at The Buckston Browne Research Farm of the Royal College of Surgeons as far as the appointments in biochemistry and physiology are concerned. The applicant for the appointment in pathology should have had a general training in all branches of the subject, with special experience in bacteriology. Salaries will be within the University scales, together with membership of the F.S.S.U. and family allowances. The commencing salaries will be determined by the age, qualifications and experience of the successful candidates.

Applications (12 copies), together with the names of 2 referees, should be sent not later than 30th November, 1955, to Mr. W. F. Davis, Secretary, Institute of Basic Medical Sciences, Royal College of Surgeons of England, Lincoln's Inn-fields, W.C.2, from whom further particulars may be obtained.

October, 1955. W. F. DAVIS, Secretary.

THE UNIVERSITY OF MANCHESTER. Applications are invited for the EWING FOUNDATION FELLOWSHIP in the Department of Education of the Deaf tenable for 2 years with a possibility of renewal after that period. Candidates should possess a medical qualification. Experience either as a Senior or Assistant Medical Officer of Health or in the field of pædiatrics or otology is desirable. The gross value of the Fellowship will be within the range of £1500–£1900 p.a.; the stipend being determined according to qualifications and experience.

Applications should be sent not later than 12th November, 1955, to the Registrar, the University, Manchester, 13, from whom further particulars and forms of application may be obtained.

THE UNIVERSITY OF MANCHESTER. Applications are invited from candidates with medical qualifications registrable in this country and interests in bacteriology or virology for the post of SENIOR LECTURER or LECTURER IN BACTERIOLOGY. Good research facilities are available. Salary scales per annum: Senior Lecturer £1500–£2000; Lecturer £1000–£1800 with membership of F.S.S.U. and children's allowance scheme; initial salary and status according to qualifications and experience. The successful candidate will be expected to take up his duties as soon as possible.

Applications from candidates in the United Kingdom should be sent, not later than 19th November, 1955, to the Registrar, the University, Manchester, 13, from whom further particulars and forms of application may be obtained. Overseas applicants should send letters of application (no forms) as soon as possible giving details of qualifications and experience, and should submit the names of at least 3 persons to whom reference may be made.

UNIVERSITY OF WESTERN AUSTRALIA. Medical SCHOOL. The Senate of the University is establishing a Medical School and applications are invited for the under-mentioned CHAIRS:—

ANATOMY: Salary £A2790 p.a. or £A3000 in event of appointee being medically qualified.
BIOCHEMISTRY: Salary £A2790 p.a.
MEDICINE: Salary £A3500 p.a.
MICROBIOLOGY: Salary £A2790 p.a. or £A3200 in event of appointee being medically qualified.
PATHOLOGY: Salary £A3200 p.a.
PHYSIOLOGY: Salary £A2790 p.a. or £A3000 in event of appointee being medically qualified.
OBSTETRICS AND GYNÆCOLOGY: Salary £A3500 p.a.
SURGERY: Salary £A3500 p.a.

Superannuation benefits similar to F.S.S.U. are provided for all above-mentioned positions.

Further particulars and information as to the method of application may be obtained from the Secretary, Association of Universities of the British Commonwealth, 36, Gordon-square, London, W.C.1. The closing date for the receipt of applications, in Australia and London, is 31st January, 1956.

UNIVERSITY OF LONDON KING'S COLLEGE will require on 1st January, 1956, a LECTURER IN PHARMACOLOGY. The appointment will be on the scale of £900–£100–£1400 with family allowances and F.S.S.U. benefits, the starting point being according to qualifications and experience.

Particulars and application forms should be obtained from the Registrar, King's College, Strand, W.C.2, whom completed applications forms should reach by 15th November.

Hospital Services : Senior Appointments

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) CONSULTANT PATHOLOGIST (whole-time or maximum sessions), National Temperance Hospital, Hampstead-road, N.W.1 (158 Beds).

Applications by 30th November, 1955.

(2) SENIOR CASUALTY OFFICER (whole-time), Bedford General Hospital (437 Beds), to organise the work of the Casualty Department and to assist in the Orthopædic and Fracture Department, subject to the general supervision of the Senior Surgeons. Higher qualification in surgery desirable. Tenure of post not exceeding 4 years. Salary within the scale £1500 (unless below age 32)–£50–£1950.

Applications by 3rd December, 1955.

(3) ASSISTANT PSYCHIATRIST (6 half-days a week), Senior Hospital Medical Officer grade, at the Marlborough Day Hospital, 38, Marlborough-place, N.W.8, recently established in new premises for all forms of psychiatric treatment, including group methods and child guidance.

Applications by 5th December, 1955.

Hospitals may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

ROYAL FREE HOSPITAL GROUP. Applications are invited from registered dental practitioners for the post of Part-time CONSULTANT DENTAL SURGEON to the Royal Free Hospital for 1 session per week. Duties to commence as soon as possible after appointment.

Applications, stating details of qualifications, experience and giving the names of 3 referees, should be forwarded to the Secretary to the Board of Governors, The Royal Free Hospital, Gray's Inn-road, W.C.1, not later than 30th November, 1955.

ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, London, W.1. Applications are invited for the appointment as Part-time CONSULTANT in E.N.T. Surgery; duties include visiting the Town and Country Hospitals when required and is assessed as 1 notional half-day a week. Candidates must have had wide experience in E.N.T. surgery.

Applications (1 copy), giving date of birth, qualifications, experience and names of 3 referees, to be addressed to the House Governor by 15th December, 1955.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Part-time CONSULTANT in E.N.T. Surgery for 4 notional half-days a week, in the Woolwich Group of hospitals, for duty mainly at St. Nicholas Hospital, Tewson-road, S.E.18, and Eltham and Mottingham Hospital, Passey-place, Eltham, S.E.9. Candidates must have had wide experience in E.N.T. surgery and be Fellows of a Royal College of Surgeons. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales). Candidates may visit the Hospital concerned.

Apply, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 12th November, 1955.

WHITTINGTON HOSPITAL, Highgate Hill, London, N.19. Locum Tenens ORTHOPÆDIC ASSISTANT SURGEON (Senior Hospital Medical Officer grade) required for 3 months. Must hold higher surgical qualification and have wide orthopædic experience including the management of fractures.

Apply Medical Superintendent (Tel. ARChway 3070).

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the appointment of a Whole-time CONSULTANT PATHOLOGIST at the Children's Hospital, who will be Head of the Department of Morbid Anatomy and Histology (the bacteriological and hæmatological work of the Hospital forms an independent Department under the charge of the Consultant Clinical Pathologist). The successful candidate may be required to undertake postgraduate studies in other approved centres, either in this country or abroad, before formally taking up his appointment in February, 1957. For this purpose a Fellowship will be available, which will include travelling expenses, subsistence allowance and a basic salary.

Applications, naming 3 referees, must be submitted on a form to be obtained from the Secretary to the Board of Governors, Queen Elizabeth Hospital, Birmingham, 15, and returned by 26th November, 1955.

LIVERPOOL REGIONAL HOSPITAL BOARD. Deva HOSPITAL, near CHESTER. Applications are invited for the post of Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer) with duties at the above Hospital, including attendance at outpatient clinics outside the Hospital. Applicants should possess the D.P.M. or an equivalent qualification and have had reasonable experience in psychiatry, including practical knowledge of outpatient work. Single accommodation is available if required.

Forms of application from, and to be returned to, Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be received not later than 19th November, 1955.

VINCENT COLLINGE, Secretary to the Board.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.

(1) CONSULTANT PHYSICIAN (whole-time or maximum part-time), Norfolk and Norwich Hospital Group. Main hospital Norfolk and Norwich (441 Beds). Candidates invited to visit hospitals by direct arrangement with Hospital Management Committee Secretary, Norfolk and Norwich Hospital.

(2) CONSULTANT RADIOLOGIST (whole-time) at Hospitals in the Peterborough and Stamford area. New appointments created to meet the increased volume of radiological work in the Group. Duties mainly at Peterborough Memorial Hospital where there is a new and fully equipped X-ray Department. Wide experience in specialty and higher qualifications essential. Candidates invited to visit Hospital by direct arrangement with Hospital Management Committee Secretary, Peterborough Memorial Hospital.

Applications (8 copies), stating age, experience and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 7th November, 1955.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. ASSISTANT DENTAL SURGEON (whole-time). Hospitals in Norfolk and Norwich Area. Main Hospitals Norfolk and Norwich, and West Norwich. Wide experience in specialty and higher qualifications necessary. Salary scale £1500–£1950.

Applications (8 copies), stating age, experience, and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 14th November, 1955. Candidates invited to visit hospitals by direct arrangement with Hospital Management Committee Secretary, Norfolk and Norwich Hospital.

LEEDS REGIONAL HOSPITAL BOARD. Whole-time Locum SENIOR HOSPITAL MEDICAL OFFICER in Anæsthetics for duties at hospitals in the Huddersfield area (including Storthes Hall Mental Hospital). The appointment will be for a period of 3 months in the first instance, but may be renewable after the expiration of that time at 3-monthly intervals up to a maximum period of 1 year. The person appointed to reside in Huddersfield.

Applications, stating age, qualifications and details of appointments held showing dates, together with the names and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, not later than 19th November, 1955.

MANCHESTER REGIONAL HOSPITAL BOARD. Whole-time RESIDENT DEPUTY MEDICAL SUPERINTENDENT AND ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer) at Springfield (Mental) Hospital, Manchester (800 Beds). Temporary accommodation available in Hospital flat, modern detached house now being built in Hospital grounds. D.P.M. essential.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by 7th November, 1955.

NEWCASTLE REGIONAL HOSPITAL BOARD. NEWCASTLE UPON TYNE HOSPITAL MANAGEMENT COMMITTEE. (Main hospitals: Newcastle General, 838 Beds; Hunter's Moor Hospital, 110 Beds; Ponteland Hospital, 74 Beds. Total geriatric beds approximately 330.) ASSISTANT PHYSICIAN (geriatrics), Senior Hospital Medical Officer status. Whole-time or part-time for minimum of 9 notional half-days per week. The Physician appointed will be responsible for the care of the health of the nursing staff at Newcastle General Hospital and for medical examinations of candidates for appointment, &c., as required. Applicants may visit the hospitals by arrangement with the Physician in charge of the Geriatric Unit, Newcastle General Hospital, Newcastle upon Tyne, 4.

Applications, together with names and addresses of 3 referees, to be forwarded to the Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

Part-time CONSULTANT E.N.T. SURGEON to Rush Green Hospital, Romford (4 sessions a week).

Full-time CONSULTANT PATHOLOGIST with special experience in bacteriology to Ilford and Barking Group, based on Barking Hospital. Further particulars on application.

Applications (6 copies), and names of 3 referees, should reach the Secretary, 11A, Portland-place, London, W.1, by Saturday, 12th November.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited to fill a vacancy for a CONSULTANT ANÆSTHETIST to the Canterbury and Isle of Thanet Groups of hospitals. Choice of whole-time service or the maximum number of part-time sessions will be offered. Candidates must have had wide experience in anæsthetics and hold the qualification of D.A. (Parts 1 and 2) or F.F.A.R.C.S. Applicants may visit the hospitals concerned.

Apply, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 12th November, 1955.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited to fill a vacancy for a Whole-time ASSISTANT PSYCHIATRIST at St. Augustine's Hospital, Chartham Down, near Canterbury, Kent. A house (unfurnished) will be available. Candidates must have had wide experience in psychiatry; experience in modern methods of treatment is essential and possession of a higher qualification is desirable. Salary within the scale £1500–£50–£1950. Applicants may visit the Hospital.

Apply, stating nationality, age, sex, qualifications and experience, including details of present appointment and of war service, together with the names and addresses of 3 referees, to the Secretary, Advisory Appointments Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, by 12th November, 1955.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires a Whole-time or maximum Part-time CONSULTANT ANÆSTHETIST for the Winchester Group of hospitals, with duties also in the Lord Mayor Treloar Group, Alton. The successful candidate will be required to reside in or within reasonable distance of Winchester.

Applications (7 copies), giving the names and addresses of 3 referees, to reach the Area Secretary, South West Metropolitan Regional Hospital Board, "Highcroft," Romsey-road, Winchester, by 19th November, 1955.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the appointment of CONSULTANT GYNÆCOLOGIST for duties at the Royal Infirmary, Greenock. The appointment will be part-time and remunerated on the basis of 2 notional half-days per week. This appointment is subject to the National Health Service (Scotland) superannuation regulations.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, not later than 30 days after the publication of this advertisement.

SHEFFIELD REGIONAL HOSPITAL BOARD. Maximum Part-time CONSULTANT CHILDREN'S PSYCHIATRIST for Barnsley, Rotherham and the surrounding West Riding Area.

Application forms and further details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 19th November, 1955.

AUSTRALIA. ROCKHAMPTON HOSPITAL, QUEENSLAND (AUST.). Applications in writing are invited for appointment as SPECIALIST E.N.T. SURGEON at the Rockhampton Base Hospital. The appointee is required to give 2 three-hour sessions per week, plus emergency calls if required by the Medical Superintendent. The appointment is a part-time one with right of private practice. Salary is £580 p.a. Rockhampton has a population of 42,000 and is the centre of a district of 90,000 population. Further particulars regarding the position and opportunity for private practice will be forwarded upon request.

Applications should be addressed to the Secretary, Rockhampton Hospitals Board, Rockhampton. Applications close 30th November, 1955.

SOUTH AFRICA. PROVINCIAL ADMINISTRATION OF THE CAPE OF GOOD HOPE. HOSPITALS DEPARTMENT. Hospital Service: vacancies.

1. Applications are invited from registered medical practitioners for appointment to the following posts:—

MEDICAL PRACTITIONER (Grade E), Pathologist, at the Pathological Laboratory, East London, Cape Province, with salary £1860 p.a.

MEDICAL PRACTITIONER (Grade E), Pathologist, at the Kimberley Hospital, Kimberley, Cape Province, with salary £1860 p.a.

MEDICAL PRACTITIONER (Grade D), Radiologist, at the Sir Henry Elliot Hospital, Umtata, Cape Province, with salary £1740 p.a.

2. In addition to the salaries indicated, cost-of-living allowances at rates prescribed from time to time by the Administrator are payable. The present rate is £234 for married persons and nil for single persons.

3. Conditions of service are prescribed in terms of the Hospital Service Ordinance No. 19 of 1941, as amended, and the regulations framed thereunder.

4. Candidates must be registered specialists.

5. The successful applicants will be required to submit satisfactory birth and health certificates and their appointment will be subject to the following conditions:—

(i) Appointment will be on contract for 5 years in the case of a citizen of a Commonwealth Country or the Republic of Ireland, and 6 years in the case of a citizen of European countries other than the United Kingdom and the Republic of Ireland.

(ii) Transport expenses (third class by rail overseas and second or cabin class steamship fare and first-class by rail in the Union) necessarily incurred by the successful applicant and his family, if any, from place of residence to the place of employment in the Province, will be defrayed by the Administration provided that, if the contract is broken within 1 year of the date of assumption of duty the person appointed must refund to the Administration the full amount paid in respect of transport expenses and if the contract is broken within 5 years of the date of assumption of duty in the case of a Commonwealth citizen and 6 years in the case of a citizen of another European country, the person appointed shall refund to the Administration the pro rata share of the full amount above referred to in respect of the unexpired period.

(iii) The persons so appointed will be offered permanent appointments during the term of contract but not earlier than 3 years or with effect from the conclusion of the contract, provided they have passed an examination in Afrikaans as second language, which examination shall not be lower than the standard required for the Junior Certificate Examination of the Department of Education of the Cape Province and provided further that their services and conduct during the period of contract are satisfactory and their state of health is such as will enable them to continue to discharge efficiently all the duties of the posts in which they will be employed.

6. Application must be made in duplicate on the prescribed form, Staff 23, which is obtainable from the Staff Clerk, Room 102, South Africa House, Trafalgar-square, London, W.C.2.

7. The completed application forms must be addressed to the Director of Hospital Services, P.O. Box 2060, Cape Town, South Africa, and must reach him not later than 21st November, 1955.

8. Candidates must state the earliest date on which they can assume duty.

NEW ZEALAND. NORTHLAND HOSPITAL BOARD, WHANGAREI, NEW ZEALAND. Applications are invited from qualified medical practitioners for the position of Part-time VISITING E.N.T. SPECIALIST.

Conditions of appointment available from the High Commissioner, New Zealand House, London, or the Secretary, Northland Hospital Board, P.O. Box 403, Whangarei, New Zealand, with whom applications close on 1st December, 1955.

Hospital Services: Junior Appointments

ACTON HOSPITAL, Gunnersbury-lane, W.3. Senior HOUSE OFFICER (resident) required for casualty duties. Post vacant 1st December, 1955.

Applications to Hospital Secretary within 7 days.

ACTON HOSPITAL, Gunnersbury-lane, London, W.3. Part-time MEDICAL REGISTRAR required for 3 sessions per week for inpatient and outpatient duties. Ministry of Health conditions of service. Salary pro rata to whole-time scale.

Applications within 7 days to Group Secretary, Central Middlesex Group Hospital Management Committee, Central Middlesex Hospital, Park Royal, N.W.10.

BETHNAL GREEN HOSPITAL, Cambridge Heath-road, London, E.2. (Acute General—309 Beds.) HOUSE SURGEON. Post recognised for F.R.C.S. and pre-registration purposes.

Applications, stating age, nationality, qualifications and experience, with copies of 2 testimonials, to the Hospital Secretary by 7th November, 1955.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. DENTAL REGISTRAR required at above Hospital for whole-time duties at hospitals in the Central Middlesex Group. Hospital may be visited by direct appointment. Post vacant 1st January, 1956.

Application forms obtainable from, and returnable to, Group Secretary, Central Middlesex Group Hospital Management Committee, Acton-lane, N.W.10, by 8th November.

CONNAUGHT HOSPITAL, Walthamstow, E.17. (118 Beds.) HOUSE SURGEON required for 6 months (General Surgery and Special Departments). Post vacant 16th November, 1955. Recognised for F.R.C.S.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to the Secretary, Hospital Management Committee, Forest Group, Langthorne-road, E.11.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. (ROYAL FREE HOSPITAL GROUP.) Applications are invited from registered Women medical practitioners for the post of Full-time SURGICAL REGISTRAR (non-resident). Recognised for the F.R.C.S. examination. Appointment for 1 year in the first instance, to commence as soon as possible. Salary in accordance with Ministry of Health scale for Registrars.

Applications, with names of 3 referees, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 11th November, 1955.

GUY'S HOSPITAL, London, S.E.1. Applications are invited for the appointment of REGISTRAR (first year) to the Radiotherapy Department (whole-time). D.M.R. preferred but not essential. Duties to commence 1st January, 1956.

Forms of application are available from the Superintendent, Guy's Hospital London Bridge, S.E.1, and should be forwarded not later than 7th November, 1955.

HAMMERSMITH HOSPITAL AND POSTGRADUATE MEDICAL SCHOOL Ducane-road, London, W.12. Applications invited for the following whole-time, non-resident, posts in the Radiodiagnostic Department:—

(a) REGISTRAR for general radiological work.

(b) REGISTRAR to carry out liaison duties with the Department of Morbid Anatomy in addition to radiological work.

Applicants should possess the D.M.R.(D.) and be prepared to work for a higher qualification.

Applications, stating age, qualifications, experience, names of 2 referees, to Secretary, Board of Governors, by 7th November.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Applications are invited from pre-registration or registered medical practitioners (Male) for the appointment of HOUSE SURGEON to the Midwifery and Gynæcology Departments, to become vacant on 5th January, 1956. Appointment will be for a period of 6 months. National Health Service salary.

Applications to reach the Secretary on or before 28th November, 1955, together with copies of 3 recent testimonials.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, N.W.8. Required, Part-time MEDICAL REGISTRAR (Male). The possession of the Membership of the Royal College of Physicians of London is desirable. Honorarium at the rate of £200 p.a.

Further particulars may be obtained from the Secretary to whom applications, with names of 3 referees, should be sent on or before Saturday, 26th November, 1955.

HACKNEY HOSPITAL, London, E.9. (General—841 Beds.) Applications are invited from registered medical practitioners for 6 months appointment, vacant 1st December, as HOUSE PHYSICIAN.

Apply Secretary, above address, by 9th November, quoting HH/HP.

HACKNEY HOSPITAL, London, E.9. (General—841 Beds.) Applications for the 12 months resident appointment of CASUALTY OFFICER (Senior House Officer grade) should reach Secretary, above address, quoting HH/SCO.

HACKNEY HOSPITAL, London, E.9. (General—841 Beds.) Applications (registered medical practitioners only) for the House Officer post of CASUALTY OFFICER AND HOUSE PHYSICIAN (Skin Department), vacant 11th November, should reach Group Secretary, above address, as soon as possible.

HACKNEY HOSPITAL, London, E.9. (General—841 Beds.) Applications for the 6 months appointment from early November of Pre-registration OBSTETRIC HOUSE SURGEON (post recognised for M.R.C.O.G.) should reach Group Secretary at above address by 4th November, quoting reference HH/PHO.

KING EDWARD MEMORIAL HOSPITAL, Ealing, and CLAYPONDS HOSPITAL, SOUTH EALING. SENIOR HOUSE OFFICER required 1st January, 1956, mainly for E.N.T. duties but with some general work at King Edward Memorial Hospital and Clayponds Hospital. Resident at Clayponds Hospital.

Applications, stating age, nationality, qualifications and experience, with copies of up to 3 recent testimonials, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, Middlesex, by 8th November, 1955.

KING EDWARD MEMORIAL HOSPITAL, Ealing. HOUSE PHYSICIAN, vacant 1st December, 1955. Preference given to persons seeking pre-registration post under Medical Act, 1950.

Applications, stating age, nationality, qualifications with dates and details of experience, together with copies of 2 recent testimonials, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 7th November, 1955.

LAMBETH HOSPITAL, Brook-drive, S.E.11. Applications are invited from pre-registration and registered medical practitioners for the appointment of HOUSE SURGEON, vacant on 25th November, 1955. The appointment is for 6 months, and is recognised for the F.R.C.S.

Forms of application from the Physician-Superintendent.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. A vacancy occurs for RESIDENT SURGICAL OFFICER appointment for 6 months with prospects of renewal. Post graded as Senior House Officer or Registrar according to qualifications and experience. Previous surgical experience necessary.

Applications, stating date of birth, qualifications with dates, and previous appointments held with copies of 3 testimonials, should be sent at once to THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON CHEST HOSPITAL. Hospital for Diseases OF THE CHEST. Applications are invited for the appointment of RESIDENT MEDICAL OFFICER. Appointment for 1 year from 1st January, 1956, and graded as Registrar.

Applications, stating age, qualifications with dates, and previous appointments held with copies of 3 testimonials, should be sent to the undersigned not later than 23rd November, 1955. THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

MIDDLESEX HOSPITAL, W.1. Applications invited for post of SURGICAL REGISTRAR, vacant 1st January.

Application forms obtainable from Deputy Superintendent, should be returned, naming 2 referees, by 8th November.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of HOUSE PHYSICIAN at The National Hospital, Queen-square, W.C.1, to commence 1st January, 1956. This post carries the grade of Registrar. The appointment will be for 1 year and will be renewed in exceptional circumstances.

Applications, with names of 3 referees, to be sent to the undersigned not later than 5th November, 1955.

H. EWART MITCHELL, Secretary to the Board of Governors.

The National Hospital, Queen-square, W.C.1.

NELSON HOSPITAL, Kingston-road, Merton, S.W.20. HOUSE SURGEON (resident), vacant 6th November. Post recognised for F.R.C.S.

Applications, stating age, qualifications, &c., with the names and addresses of 2 referees, to be sent to the Secretary at the above address.

PADDINGTON GENERAL HOSPITAL, Harrow-road, W.9. (564 Beds.) Applications are invited for the posts, commencing 1st January, 1956, of 3 SENIOR HOUSE OFFICERS (casualty), resident on duty. Recognised for F.R.C.S.

Applications, stating age, experience, qualifications, together with names and addresses of 2 referees, to be sent to Secretary to Committee by 11th November, 1955.

PADDINGTON GENERAL HOSPITAL, Harrow-road, W.9. Applications are invited for the undermentioned posts commencing 1st December, 1955. Preference will be given to pre-registration candidates where appropriate :—

2 HOUSE SURGEONS (general surgery), pre-registration posts. Recognised for F.R.C.S.

2 HOUSE SURGEONS (obstetrics and gynæcology). 1 pre-registration post. Both recognised for M.R.C.O.G.

4 HOUSE PHYSICIANS (general medicine), pre-registration posts.

Applications, stating age, qualifications, medical school, experience, together with names and addresses of 2 referees, to reach Secretary to Committee by 11th November, 1955.

PADDINGTON GREEN CHILDREN'S HOSPITAL, W.2. (ST. MARY'S HOSPITAL.) Applications are invited for the post of HOUSE SURGEON (pre-registration post), vacant 1st December, 1955. Tenable for 6 months.

Applications, stating age, nationality, qualifications with dates, and experience, with copies of 3 recent testimonials, should reach the Secretary not later than Saturday, 5th November, 1955.

PADDINGTON GREEN CHILDREN'S HOSPITAL, W.2. (ST. MARY'S HOSPITAL.) Applications are invited for the post of HOUSE PHYSICIAN (pre-registration post), vacant 1st December, 1955. Tenable for 6 months.

Applications, stating age, nationality, qualifications with dates, and experience, with copies of 3 recent testimonials, should reach the Secretary not later than Saturday, 5th November, 1955.

PRINCESS BEATRICE HOSPITAL, Earls Court, London, S.W.5. CASUALTY OFFICER (some anæsthetic duties), resident. Senior House Officer grade.

Applications, stating age, qualifications, with 3 testimonials, to House Governor, not later than Thursday, 3rd November, 1955.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. (248 Beds.) Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER RESIDENT SENIOR HOUSE SURGEON, for a period of 6 months, vacant 26th December, 1955.

Application form from Secretary, Tottenham Group Hospital Management Committee (Group No. 4), The Green, N.15, to be returned by 19th November, 1955.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. (248 Beds.) Applications are invited from registered medical practitioners for the appointment of RESIDENT SENIOR HOUSE SURGEON (third post), recognised for F.R.C.S. examination, vacant 22nd December, 1955.

Application form from Secretary, Tottenham Group Hospital Management Committee (Group No. 4), The Green, N.15, to be returned by 19th November, 1955.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. CLINICAL ASSISTANTS. Applications are invited from registered medical practitioners for appointment to the undermentioned, paid and unpaid Clinical Assistant posts in the following departments, for 1 year from 1st January, 1956 : Paediatric, Gynæcological, Neurological, General Surgical, General Medicine, Ophthalmic, Genito-urinary, Dermatological and Psychiatric.

Applications to the Secretary, Tottenham Group Hospital Management Committee, The Green, Tottenham, N.15, by 9th November, 1955. For further details apply to Hospital.

PRINCE OF WALES'S GENERAL HOSPITAL, N.15. (248 Beds.) Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER RESIDENT SENIOR CASUALTY OFFICER, recognised for F.R.C.S. examination, for a period of 6 months, vacant 18th December, 1955.

Application form from Secretary, Tottenham Group Hospital Management Committee (Group No. 4), The Green, N.15, to be returned by 26th November, 1955.

QUEEN MARY'S (ROEHAMPTON) HOSPITAL, London, S.W.15. (532 Beds.) REGISTRAR (radiology) required for whole-time duty. National Health Service terms and conditions of service.

Detailed applications (9 copies), giving nationality, date of birth, qualifications and experience, including present appointments and the names of 3 referees, should reach the Secretary, Ministry of Health, Division 4(v), Norcross, Blackpool, Lancashire, by 19th November, 1955.

ROYAL LONDON HOMŒOPATHIC HOSPITAL, Great Ormond-street and Queen-square, W.C.1. Applications are invited from registered medical practitioners for the appointment of HOUSE SURGEON vacant 5th December, 1955. Post recognised for F.R.C.S. examinations. 6 months appointment. National Health Service terms and conditions of service. Candidates will be required to attend for interview.

Applications, stating age and full particulars, to Secretary.

ROYAL NATIONAL THROAT, NOSE AND EAR HOS-PITAL, Gray's Inn-road, W.C.1, and Golden-square, W.1. RESIDENT HOUSE SURGEON (post-registration post). Applications are invited for a 6 months appointment as from 1st December, 1955, with salary and conditions as laid down for House Officers in the terms and conditions of service in the National Health Service.

Applications, stating age, qualifications, full details of previous experience (particularly in this specialty), with copies of 1–3 recent testimonials, should be sent to the House Governor immediately.

ROYAL NORTHERN HOSPITAL, Holloway, London, N.7. (279 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required in the Orthopædic and Fracture Department of the above Hospital. Candidates may visit the Hospital by direct appointment.

Application forms obtainable from, and returnable to, the Secretary, Royal Northern Hospital, N.7, by 8th November, 1955.

ROYAL FREE HOSPITAL. Applications are invited from registered medical practitioners for the post of SENIOR CASUALTY OFFICER at the Royal Free Hospital, Gray's Inn-road, W.C.1. The appointment is full time, resident, for 6 months ; duties to commence on 1st January, 1956. Salary and conditions of service in accordance with those laid down by the Ministry of Health for Senior House Officers.

Application forms may be obtained from the Secretary to the Board of Governors, The Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned not later than 16th November, 1955.

ROYAL FREE HOSPITAL GROUP. Applications are invited for the post of REGISTRAR to the X-Ray Department of the Royal Free Hospital. Duties to commence 1st December. Appointment for 1 year in the first instance. Candidates to hold D.M.R. (D).

Application forms may be obtained from the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1. They should be returned not later than 4th November.

ROYAL FREE HOSPITAL GROUP. Applications are invited for the appointment of REGISTRAR to the Orthopædic Department. Applicants must be registered medical practitioners and Fellows of the Royal College of Surgeons. The appointment is for 1 year in the first instance. Duties to commence on 1st January, 1956.

Application forms may be obtained from the Secretary to the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1. They should be returned not later than 4th November.

ROYAL FREE HOSPITAL GROUP. Applications are invited for the posts of SENIOR SURGICAL REGISTRAR in the above Group. 1 to work primarily at Royal Free Hospital, Gray's Inn-road, and the other to work at the Hampstead General Hospital. Candidates should be registered medical practitioners and Fellows of the Royal College of Surgeons. The appointments are recognised under the Senior Registrar establishment and are for 1 year in the first instance. Duties to commence on 1st January, 1956.

Applications, together with 3 names of referees, should be sent to the Secretary of the Board of Governors, Royal Free Hospital, Gray's Inn-road, W.C.1. They should be sent not later than 4th November.

ROYAL MARSDEN HOSPITAL, Fulham-road, London, S.W.3 (lately Royal Cancer Hospital). Applications are invited for the post of SENIOR REGISTRAR (full-time) in the Department of Pathology. The post is open only to candidates who have completed a period of training as Senior Registrars, or are from overseas, and who wish to take a period of advanced training for not more than 2 years. Duties and training cover all branches of pathology.

Applications, quoting the names of 3 referees, should be submitted by 8th November, 1955, on a form which may be obtained from the House Governor.

ROYAL MASONIC HOSPITAL, Ravenscourt Park, London, W.6. Applications are invited for the post of RESIDENT SURGICAL REGISTRAR. Appointment on or about 12th December. Gross salary: first year £850 (residential emoluments of £130 deductible); second year £965 (residential emoluments of £145 deductible).

Please state age, qualifications, past and present appointments, and include 2 recent testimonials and/or the names of 2 referees. Applications should reach the undersigned (from whom further information may be obtained) on or before 10th November, 1955.

R. E. LAWSON, Secretary and House Governor.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited from registered Women medical practitioners for the post of ANÆSTHETIC REGISTRAR (either resident or prepared to live within 20 minutes of the Hospital). D.A. desirable but not essential. Post recognised for D.A. Salary £850–£115–£965 p.a., less £150 p.a. for board, lodging, &c., if resident. The appointment is normally for 2 years. Canvassing will disqualify, but candidates are not precluded from visiting the Hospital if they so desire.

For form of application apply (enclosing stamped addressed envelope) to the Secretary, Lambeth Group Hospital Management Committee, Renfrew-road, S.E.11. Completed application forms should be returned not later than 12th November, 1955.

ST. GEORGE-IN-THE-EAST HOSPITAL, Raine-street, Wapping, E.1. Applications are invited for the post of HOUSE PHYSICIAN (pre- or post-registration). Post vacant 18th November, 1955. Tenable for 6 months. Salary, &c., in accordance with national scale.

Applications, stating age, nationality, qualifications, and experience, together with copies of 3 recent testimonials, to be forwarded to the Medical Superintendent.

ST. MARY'S HOSPITAL, W.2. Applications are invited for the post of Part-time OUTPATIENT SURGICAL ASSISTANT for 3 notional half-days per week (Monday, P.M., Wednesday, A.M., Wednesday, P.M.), graded Senior House Officer. The appointment will be for a first period of 12 months and the successful candidate will be required to commence duties as soon as possible.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointments, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, by 16th November, 1955.

ST. MARY'S HOSPITAL, W.2. Applications are invited for the post of RESIDENT HOUSE PHYSICIAN to the Neurological, Dermatological and Venereological Departments, for which either pre-registration interns seeking their second House Officer appointment, or post-registration candidates are eligible to apply. The appointment is for a period of 6 months with effect from 1st December, 1955.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and National Health Service gradings of previous and present appointment, together with the names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, by 5th November, 1955.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be a vacancy for a Whole-time ASSISTANT MEDICAL REGISTRAR (Registrar grade) on 19th February, 1956.

Further particulars and form of application, which must be returned not later than 6th December, 1955, may be obtained from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

THE HOSPITAL FOR SICK CHILDREN, Great Ormond-street, London, W.C.1. There will be vacancies in December for 2 Whole-time ASSISTANT MEDICAL REGISTRARS (Registrar grade).

Further particulars and form of application, which must be returned not later than 14th November, 1955, may be obtained from the undersigned.

H. F. RUTHERFORD, House Governor and Secretary.

WANSTEAD HOSPITAL, Hermon Hill, E.11. (191 Beds.) Applications are invited for the post of CASUALTY OFFICER, recognised for F.R.C.S. Graded Senior House Officer. Vacant 13th November, 1955. Salary £745 p.a., less £150 p.a. for board, lodging, &c.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to the Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

ASCOT. HEATHERWOOD ORTHOPÆDIC HOSPITAL. (202 Beds—Adults and Children.) Applications are invited for post of RESIDENT SENIOR HOUSE OFFICER (orthopædics). Appointment offers excellent opportunities to those reading for a higher qualification.

Applications, with names of 2 referees, to Hospital Secretary.

ASHFORD HOSPITAL, Ashford, Middlesex. Staines GROUP HOSPITAL MANAGEMENT COMMITTEE. RESIDENT HOUSE SURGEON (Male) required at above Hospital (approximately 500 Beds), for Traumatic and Orthopædic Unit. 6 months appointment vacant now. Preference given to pre-registration candidates.

Applications, stating age, qualifications and experience, with copies of up to 3 recent testimonials, to Medical Director of Hospital, immediately.

BARNSTAPLE. NORTH DEVON INFIRMARY. (Central Group Hospital of 105 Beds.) SENIOR HOUSE SURGEON post vacant from 1st January, 1956, for 1 year. Salary £745 p.a. (5-roomed furnished flat available, rent £75 p.a.)

Applications, with customary details, to Group Secretary, North Devon Hospital Management Committee, 19, Alexandra-road, Barnstaple.

BEDFORD GENERAL HOSPITAL. (437 Beds.) Pre-registration HOUSE SURGEON required for casualty and orthopædic duties.

Applications, stating age, nationality, qualifications, previous appointments (if any), together with copies of 2 recent testimonials, should be forwarded to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford.

BEDFORD GENERAL HOSPITAL. (437 Beds.) North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. REGISTRAR required for busy acute Orthopædic and Traumatic Department at above Hospital. Previous orthopædic experience desirable. Candidates may visit Hospital by appointment with the Group Secretary.

Application forms obtainable from, and returnable to, Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, as soon as possible.

BEDFORD GENERAL HOSPITAL. (437 Beds.) 2 resi-dent Pre-registration HOUSE PHYSICIANS required middle December.

Applications, stating age, nationality, qualifications, previous appointments (if any), together with copies of 2 recent testimonials, should be forwarded to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford, by not later than 14th November, 1955.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 Beds.) ORTHOPÆDIC HOUSE SURGEON (first, second, or third post). Offers good opportunity for general experience in busy acute general hospital. Approved pre-registration post. Fully qualified practitioners may apply. Recognised for F.R.C.S.

Apply to Group Secretary.

BIRMINGHAM, 18. DUDLEY ROAD HOSPITAL. (780 Beds.) SENIOR HOUSE OFFICER required in Casualty Department (40,000 attendances per year). Resident or non-resident. Recognised for F.R.C.S. Tenable for 6 or 12 months. Vacant early November.

Detailed applications, with copies of 3 testimonials, to Secretary.

BIRMINGHAM, 15. ROYAL ORTHOPÆDIC HOS-PITAL. (Long and short-term orthopædic cases (non-traumatic), 336 Beds and extensive outpatients services. Hospital recognised by Royal College of Surgeons.) SENIOR HOUSE OFFICER, 21st November, 1955. Registered medical practitioner, preferably with orthopædic experience.

Applications, with copies of testimonials, to Administrator.

BIRMINGHAM (near). ST. MARGARET'S HOSPITAL, GREAT BARR PARK, BIRMINGHAM, 22A. (For Mental Defectives —1470 Beds.) Locum JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female) required at above Hospital as from 8th November, 1955. Salary £17 10s. per week. Accommodation and board in Hospital available for which a charge of £130 p.a. will be made.

Applications, stating age, qualifications, and experience, together with the names of 2 referees, should be forwarded immediately to the Medical Superintendent.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) Birmingham (Selly Oak) Group, Oak Tree-lane, Birmingham, 29

SURGICAL REGISTRAR. Duties with accident surgery team and possibility of transfer to Burns Unit, Birmingham Accident Hospital (215 Beds). General surgical experience essential. Higher qualification an advantage.

(2) Stoke-on-Trent Group, Princes-road, Stoke-on-Trent

REGISTRAR (chest diseases), experienced in General Messing required for Cheshire Joint Sanatorium, near Market Drayton (305 Beds).

Application forms from Group Secretaries, to be returned before 14th November, 1955. Candidates may visit hospitals.

BIRMINGHAM. UNITED BIRMINGHAM HOSPITALS. Applications are invited for the appointment of a MEDICAL REGISTRAR (with M.R.C.P.) or SENIOR HOUSE OFFICER according to qualification and experience. The successful candidate will have clinical duties in the Queen Elizabeth Hospital and will also have the duties and status of a part-time member of the University staff in the University Department of experimental Pathology. The post is non-resident in the first instance but the appointee must be prepared to undertake resident duties as required.

Forms of application may be obtained from the Secretary, United Birmingham Hospitals, Queen Elizabeth Hospital, Birmingham, 15, and should be returned by 21st November, 1955.

BIRMINGHAM. THE UNITED BIRMINGHAM HOSPITALS. Applications are invited for the post of RESIDENT OBSTETRIC AND GYNÆCOLOGICAL REGISTRAR for duties at the Queen Elizabeth Hospital and The Birmingham and Midland Hospital for Women (Professorial Unit), to commence immediately.

Forms of application with details of appointment may be obtained from, and should be returned not later than 16th November, 1955, to the House Governor, Birmingham and Midland Hospital for Women, Showell Green-lane, Birmingham, 11. G. A. PHALP, Secretary.

BISHOP'S STORTFORD AND DISTRICT HOSPITAL, Rye-street, BISHOP'S STORTFORD, HERTS. (67 Beds—medical, surgical and maternity. Midway between London and Cambridge. Main Line Railway from Liverpool Street.) Applications are invited from registered medical practitioners for the appointment of RESIDENT SENIOR HOUSE OFFICER. Appointment to commence as soon as possible. Salary £745 p.a.

Applications, stating age, nationality, qualifications and experience, with copies of recent testimonials or names of referees, should be sent to the Hospital Secretary, Haymeads Hospital, Bishop's Stortford, Herts.

BLACKPOOL. VICTORIA HOSPITAL. (348 Beds.) SENIOR HOUSE OFFICER (anæsthetics). Post recognised for the F.F.A.R.C.S. This is a busy general hospital offering a sound and varied experience in anæsthetics.

Applications, giving age, qualifications, experience, and the names and addresses of 2 referees, should be sent to the Hospital Secretary.

BLACKPOOL. VICTORIA HOSPITAL. (348 Beds.) Applications are invited for the post of RESIDENT HOUSE OFFICER (casualty and orthopædics), vacant on 1st January next, which is recognised for the F.R.C.S. examination and for pre-registration purposes. This is a busy acute hospital with a large Outpatient Department and a Casualty Department which is subjected to increased activity in the holiday season.

Applications, stating age, qualifications, experience together with the names and addresses of 2 referees, should be addressed to the Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road, BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER (anæsthetics) required for post vacant on 24th November. The post, which is recognised for the D.A. and F.F.A.R.C.S., is tenable for 12 months. Experience in Thoracic Unit available.

Applications to the Deputy Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL. (494 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of GENERAL HOUSE SURGEON, vacant 2nd December. The appointment is recognised for the F.R.C.S. examination and for pre-registration purposes.

Applications to the Deputy Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL. (494 Beds.) BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE SURGEON for general and thoracic surgery, vacant 19th November, 1955. The appointment is recognised for the F.R.C.S. examination and for pre-registration purposes.

Applications to the Deputy Hospital Secretary.

BRAINTREE, ESSEX. BLACK NOTLEY HOSPITAL. Applications invited for the posts of HOUSE SURGEON and HOUSE PHYSICIAN. The successful applicant will serve 6 months as House Surgeon followed by 6 months as House Physician. First, second, third, or pre-registration posts. Surgical post includes duties in general surgical and gynæcological wards. Recognised for F.R.C.S. Medical post includes duties in medical and pædiatric wards.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

BRIGHTON. ROYAL ALEXANDRA HOSPITAL FOR SICK CHILDREN, Dyke-road. (130 Beds and Cots.) BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE. Vacancy for HOUSE PHYSICIAN for a period of 6 months from 29th November, 1955. The post offers wide experience in pædiatrics and is recognised for D.C.H. Previous experience in specialty an advantage.

Applications, stating age, nationality, qualifications, and experience, together with copies of recent testimonials, to reach the Administrative Officer by 10th November, 1955.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (300 Beds.) Locum CASUALTY/ORTHOPÆDIC HOUSE SURGEON required until 8th December.

Applications, stating usual particulars, and naming 2 referees, to the Administrative Officer.

BRIGHTON. ROYAL SUSSEX COUNTY HOSPITAL. (300 Beds.) 2 HOUSE SURGEONS required 18th November and 1st December. Recognised for pre-registration and F.R.C.S.

Applications, stating usual particulars, and naming 2 referees, to the Administrative Officer.

BRISTOL. COSSHAM/FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required in the Thoracic Surgery Department, which is the Regional Thoracic Surgery Centre (120 Beds) for the South West.

Applications, with full particulars, should be addressed to the Group Secretary, Frenchay Hospital, Bristol, quoting "Thoracic."

BRISTOL (near). HAM GREEN HOSPITAL, Pill, near BRISTOL. Applications are invited for the post of HOUSE OFFICER in the tuberculosis wards (188 Beds) of the above Hospital. The Hospital is fully equipped for the modern treatment of pulmonary tuberculosis including regular major thoracic surgery.

Apply Secretary, Ham Green Hospital, Pill, near Bristol.

BOLTON DISTRICT GENERAL HOSPITAL. (604 Beds.) RESIDENT HOUSE PHYSICIAN, vacant early November, tenable for 6 months and recognised under the Pre-registration Service Scheme.

Applications, stating age, nationality, qualifications, and details of experience, together with the names of 2 referees, to Group Secretary, Bolton and District Hospital Management Committee, The Royal Infirmary, Bolton.

BURTON-ON-TRENT GENERAL HOSPITAL. (251 Beds.) Applications invited for the following pre-registration appointments :—

HOUSE SURGEON, commencing 15th January, 1956.

HOUSE OFFICER (gynæcology and obstetrics), commencing 1st August, 1956.

Candidates awaiting examination results may submit application immediately to Group Secretary.

CANTERBURY. KENT AND CANTERBURY HOSPITAL. (277 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (casualty), which is now vacant. Salary £745 p.a. Recognised for the F.R.C.S.

Applications to be sent to the Hospital Secretary at the above Hospital, together with copies of 3 recent testimonials.

CARDIFF. GLAN ELY HOSPITAL, Fairwater, Cardiff. (240 Beds.) SENIOR HOUSE OFFICER (resident) required at above Hospital for treatment of pulmonary (Thoracic Unit) and all forms of non-pulmonary tuberculosis.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. ROYAL HAMADRYAD GENERAL AND SEAMEN'S HOSPITAL. RESIDENT SENIOR HOUSE OFFICER (surgical) required at above Hospital. Post covers 44 Beds—genito-urinary, general surgery and outpatients. Department under care of Consultants from United Cardiff Hospitals.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. THE UNITED CARDIFF HOSPITALS. The Board of Governors invites applications for the appointment of REGISTRAR to the Department of Neurosurgery.

Application forms can be obtained from the Secretary, United Cardiff Hospitals, Cardiff Royal Infirmary.

CHEPSTOW, MONMOUTHSHIRE. PLASTIC SURGERY, JAW INJURIES AND BURNS CENTRE, ST. LAWRENCE HOSPITAL. (109 plastic surgery, 50 orthopædic beds.) SENIOR HOUSE OFFICER in Plastic Surgery required. Previous experience in specialty not essential. The Hospital intakes from most of Wales and the successful candidate will receive a thorough training. Second Senior House Officer in plastic surgery recently appointed and there is also a Senior House Officer in orthopædics, Senior Registrar non-resident, and 2 Registrars, all in plastic surgery, resident. Salary £745, less £150 board-residence.

Write, quoting 2 referees, to T. A. JONES, Group Secretary, 64, Cardiff-road, Newport, Mon.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botley's Park War Hospital). (430 Beds.) ORTHOPÆDIC HOUSE SURGEON required as soon as possible. Senior House Officer or House Officer (intern) grade. Post recognised for F.R.C.S. and Pre-registration Service, and preference given to provisionally registered candidates. Salary in accordance with terms and conditions of National Health Service.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, as soon as possible.

CHICHESTER. GRAYLINGWELL HOSPITAL. REGISTRAR (Lady or Gentleman) required at the above Psychiatric Hospital which has Departments of Research and Neurology and to which are attached 3 active outpatient clinics. All modern treatments are practised and organised training is given for D.P.M. House available for married man or furnished accommodation available for single officer. Candidates may visit the Hospital by arrangement with the Medical Superintendent.

Application forms (obtainable from the Group Secretary) are returnable within 14 days of the appearance of this advertisement.

CHICHESTER. ROYAL WEST SUSSEX HOSPITAL. (202 acute beds.) RESIDENT HOUSE SURGEON required for 6 months appointment. National salary scale for first, second, or third posts. Post approved for pre-registration practitioners. Post recognised for F.R.C.S. 7 residents including Resident Surgical Officer and 3 House Surgeons. Vacant from 27th November, 1955.

Apply to Senior Administrative Officer.

COLCHESTER. ESSEX COUNTY HOSPITAL. (188 Beds.) Applications invited for post of SENIOR HOUSE OFFICER (casualty and radiotherapy). Post tenable for 6 months or 1 year. Recognised for F.R.C.S.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

CROYDON. MAYDAY HOSPITAL. (618 Beds.) Senior HOUSE SURGEON (resident) for Fracture and Orthopædic Unit required immediately for 6 months in first instance.

Application forms obtainable from GEORGE A. PAINES, Secretary, Croydon Group Hospital Management Committee, General Hospital, London-road, Croydon, to be returned immediately.

DOUGLAS, I.O.M. NOBLE'S ISLE OF MAN HOSPITAL. (160 Beds.) Applications are invited for the post of HOUSE SURGEON. The post is recognised for pre-registration purposes, and is now vacant. 4 residents on the staff. Salary £425–£475–£525 according to experience. A deduction of £125 a year for residential emoluments. Appointment for 6 months.

Apply immediately, giving full particulars and copies of 2 recent testimonials or names and addresses of 2 referees, to the Secretary, Noble's Isle of Man Hospital, Douglas.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. 2 SENIOR HOUSE OFFICERS for the Chest Unit. 1 post vacant now: 1 vacant 1st December. Medical and surgical duties.

Apply, giving age, qualifications, experience, and names of 2 referees, to Group Secretary at above address.

DEWSBURY, YORKSHIRE. STAINCLIFFE GENERAL HOSPITAL. (311 Beds.) Applications are invited for the post of RESIDENT SURGICAL OFFICER (Senior House Officer grade), vacant 27th December, 1955. The surgical unit comprises 52 Beds and the Hospital is recognised for the F.R.C.S.

Applications, giving full details, should be sent to the Administrative Officer at the Hospital.

DRIFFIELD, YORKSHIRE. EAST RIDING GENERAL HOSPITAL. (247 Beds.) HOUSE PHYSICIAN (first, second, or third post), vacant 4th November. Approved pre-registration post. Fully qualified practitioners may apply. Duties to include acute and chronic sick and casualties. Good general experience for first house appointment.

Apply Group Secretary, Westwood Hospital, Beverley, Yorkshire.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.

(1) REGISTRAR in Medicine, Newmarket General Hospital. Post provides good experience in general medicine and diseases of the chest. Previous experience of tuberculosis an advantage. House available. Appointment for 1 year renewable for second year. Candidates invited to visit Hospital by direct arrangement with Physician-Superintendent.

(2) REGISTRAR in Psychiatry, Fulbourn Hospital and Addenbrooke's Hospital, Cambridge. Joint appointment by Regional Hospital Board and Board of Governors of United Cambridge Hospitals. Trainee post which provides full facilities for clinical work with all types of patients and study for D.P.M. The successful candidate will work initially at Fulbourn Hospital and later also undertake duties at Addenbrooke's Hospital. Appointment for 1 year renewable for second year. Candidates invited to visit Hospitals by direct arrangement with Medical Superintendent, Fulbourn Hospital.

Applications, stating age, experience and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 14th November, 1955.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Psychiatry, East Suffolk Mental Hospitals. St. Clement's Hospital, Ipswich (450 Beds), and St. Audry's Hospital, Melton, near Woodbridge (1100 Beds), and associated General Hospital outpatient clinics. There is a very active Outpatient Department and Electro-encephalographic Department at St. Clement's Hospital. Trainee post. Both hospitals are recognised for the D.P.M.

Applications, stating age, experience, and names of 3 referees, to Secretary of Board, 117, Chesterton-road, Cambridge, by 7th November, 1955. Candidates invited to visit hospitals by direct arrangement with Medical Superintendent, St. Audry's Hospital.

EAST FIFE HOSPITALS BOARD OF MANAGEMENT. Applications are invited for the post of REGISTRAR at Forth Park Maternity Hospital, Kirkcaldy (54 Beds), and Associated Antenatal Clinics. The Hospital is recognised for the Membership of the Royal College of Obstetricians and Gynæcologists. Salary in accordance with national scale. Duties to commence 1st December, 1955.

Apply, giving names of 3 referees, to the Medical Superintendent, East Fife Hospitals Board of Management, 243a, High-street, Kirkcaldy.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (715 Beds.) RESIDENT PÆDIATRIC HOUSE PHYSICIAN for above Hospital. Post vacant 15th December, 1955. 6 months appointment. Post recognised for D.C.H. and pre-registration purposes.

Applications, stating age, qualifications and experience and enclosing up to 3 copies of recent testimonials, to Medical Director by 12th November, 1955.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT HOUSE SURGEON required for Orthopædic, E.N.T., and Eye Departments, vacancy 6th December. Pre-registration post.

Applications, stating age, qualifications, and experience, with copies of 2 recent testimonials, should be sent immediately to Group Secretary at above address.

EPSOM DISTRICT HOSPITAL, Dorking-road, Epsom, SURREY. RESIDENT HOUSE SURGEON required 6th December. Pre-registration post. Recognised for F.R.C.S.

Applications, stating age, qualifications, and experience, with copies of 2 recent testimonials, should be sent immediately to Group Secretary, at above address.

GREAT YARMOUTH AND GORLESTON GENERAL HOSPITAL, DENE SIDE, GREAT YARMOUTH. HOUSE SURGEON (Male or Female) required. Post vacant 1st November, 1955. The Hospital is staffed by a Consultant General Surgeon and a Consultant E.N.T. Surgeon, and is regularly visited by Consultant staff from the Norfolk and Norwich Hospital. The post is a pre-registration post at a salary of £425, £475, or £525 p.a. according to experience, less £125 p.a. for residence. Membership of a Medical Defence Society is a condition of appointment.

Applications, stating age, qualifications, and experience, with names of 2 referees, to Hospital Secretary.

GRIMSBY GENERAL HOSPITAL. Grimsby Hospital MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER for casualty duties required. Resident post. Recognised by Royal College of Surgeons for the Final Fellowship examination. Hours: normally 9 A.M.–6 P.M. Monday–Friday; 9 A.M.–NOON Saturday, sharing night duty on rota with all other resident staff. Establishment consists of Senior Hospital Medical Officer (casualty) and the post now being advertised. The Hospital possesses a well-equipped medical library.

Applications, with names and addresses of 2 referees, to the Hospital Secretary, Grimsby General Hospital.

GLASGOW ROYAL INFIRMARY. Senior House Officer in Surgery. Duties at above Infirmary.

Write not later than 12th November, 1955, giving 3 names for reference, to the Secretary, Board of Management for Glasgow Royal Infirmary and Associated Hospitals, 135, Buchanan-street, Glasgow, C.1.

GUILDFORD GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of Whole-time REGISTRAR (preferably resident), in the Radiotherapy Unit, St. Luke's Hospital, Guildford, where extensive experience in both surgical and radiation treatment of malignant disease can be obtained. Candidates may visit the Unit by arrangement direct.

Application forms obtainable from Secretary, Guildford Group Hospital Management Committee, St. Luke's Hospital, Guildford, to whom they should be returned not later than 11th November, 1955.

HAREFIELD HOSPITAL, Harefield, Middlesex. (632 Beds, including 86 for thoracic surgery, 446 for tuberculosis, and 100 for general medicine and surgery.) **NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.** Supernumerary SENIOR REGISTRAR in Thoracic Surgery. Applications are invited from practitioners from overseas (particularly the Commonwealth) with considerable experience in general surgery, who wish to have a period of training in thoracic surgery in England, with the intention of returning subsequently to their own country. Training may include a period spent at Clare Hall Hospital, South Mimms. Appointment in the first instance for 1 year, with eligibility for 1 further year. Commencing salary £1100 p.a. Resident accommodation available, but appropriate deduction will be made. Hospital may be visited by direct appointment if practicable.

Application forms obtainable from, and returnable to, Group Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex, by 3rd December, 1955.

HAREFIELD HOSPITAL REGIONAL THORACIC SURGICAL UNIT, HAREFIELD, MIDDLESEX. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited from registered medical practitioners for the post of REGISTRAR to the Harefield Thoracic Surgical Unit which serves the North West Metropolitan Region. In the Hospital there are 90 Beds for non-tuberculous chest conditions and 446 Beds for tuberculosis. The appointment thus affords a wide experience in all branches of thoracic surgery. Candidates must have had previous surgical experience and preference will be given to candidates with a higher surgical qualification. The appointment will be held in the first instance for 1 year.

Application forms obtainable from, and returnable to, the Secretary, Harefield and Northwood Group Hospital Management Committee, Mount Vernon Hospital, Northwood, Middlesex, by 8th November, 1955.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. (170 Beds.) HOUSE PHYSICIAN (pre-registration) required. Post vacant 1st December, 1955.

Applications, giving full details and names of 2 referees, should be sent to the Hospital Secretary.

HILLINGDON HOSPITAL, near Uxbridge, Middlesex (General—705 Beds.) PÆDIATRIC REGISTRAR required at above Hospital. Previous pædiatric experience essential. Duties include experience in Children's Medical Ward, in Neonatal Unit, and in Pædiatric Outpatient Clinics. Unit recognised for D.C.H. Candidates may visit Hospital by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Uxbridge Group Hospital Management Committee, The Furze, Hillingdon, near Uxbridge, Middlesex, by 12th November.

HUDDERSFIELD ROYAL INFIRMARY. (312 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from provisionally registered or registered medical practitioners for the post of HOUSE PHYSICIAN to commence duties immediately. Salary in accordance with national scale.

Applications, together with copies of 3 recent testimonials, to be addressed to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

HUNTINGDON COUNTY HOSPITAL. Applications are invited for the post of HOUSE OFFICER (surgical) becoming vacant beginning November. Post recognised for pre-registration purposes.

Apply, with full particulars and names of 2 referees, to Group Secretary, Hospital Management Committee Offices, Newmarket General Hospital, Newmarket.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE PHYSICIAN, vacant on 2nd December, 1955. Approved pre-registration post.

Applications, stating age, nationality and experience, together with copies of 3 recent testimonials, to reach the Hospital Secretary by 8th November, 1955.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of HOUSE SURGEON to the General Consulting Surgeon. The post is recognised for pre-registration and for the F.R.C.S. examinations.

Applications, with copies of recent testimonials, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL (Heath ROAD WING), IPSWICH. (270 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER (Fracture and Orthopædic Department). The post is normally of 1 years duration. It is recognised as part of the necessary surgical experience for the Final F.R.C.S.

Applications, stating age, qualifications, and experience, together with recent testimonials, to the Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL (Heath ROAD WING), IPSWICH. (270 Beds.) Applications invited for post of HOUSE SURGEON (House Officer) to General Surgeons vacant immediately. Pre-registration post, 6 months duration, recognised for R.C.S. examinations.

Applications, stating age, experience, and qualifications, with copies of recent testimonials, to Hospital Secretary.

ILFORD. KING GEORGE HOSPITAL. There will be a vacancy for a CASUALTY OFFICER at the above Hospital on 12th December, 1955, at a salary of £745 p.a., less £145 p.a. emoluments. Senior House Officer grade. This post is recognised for the F.R.C.S.

Applications, giving full particulars and accompanied by testimonials, should be sent to the undersigned within 7 days of the appearance of this advertisement.

H. G. HARRIS, Group Secretary,
Ilford and Barking Group Hospital Management Committee.
King George Hospital, Ilford.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. Senior HOUSE OFFICER required for Specials Department which comprises E.N.T. and Plastic Surgery Units (inpatients and outpatients). Post vacant now.

Applications, stating age, nationality, qualifications and experience, with copies of up to 3 recent testimonials, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 8th November, 1955.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. WOMEN'S HOSPITAL. Applications are invited for a post of SENIOR HOUSE OFFICER in Gynæcology for the period to 30th September, 1956.

Apply by 12th November, 1955, on form obtainable from the Secretary, The United Liverpool Hospitals, 80, Rodney-street, Liverpool, 1.

LIVERPOOL. THE UNITED LIVERPOOL HOSPITALS. Applications are invited for a post of REGISTRAR in Orthopædics for the year 1st January–31st December, 1956. Annual reappointment thereafter until completion of the normal period of training will be considered without need for further application.

Apply by 12th November, 1955, on form obtainable from the Secretary, 80, Rodney-street, Liverpool, 1.

LIVERPOOL. WALTON HOSPITAL. Applications are invited for a post as SENIOR HOUSE OFFICER in the Regional Neurosurgical Unit. Vacant now.

Applications to Physician-Superintendent, Walton Hospital, Liverpool, 9.

LOUTH, LINCOLNSHIRE. COUNTY INFIRMARY. (215 Beds.) GRIMSBY HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (orthopædic and casualty), now vacant at this General Hospital.

Applications, giving full details, together with the names of 2 referees, should be addressed to the Hospital Secretary.

LUTON AND DUNSTABLE HOSPITAL, Luton, Bedfordshire. SENIOR HOUSE OFFICER (resident) in Medicine with certain duties in Pathology required. Vacant 21st November.

Applications, stating age, nationality, qualifications and experience, together with copies of 3 recent testimonials, to be sent to the Secretary by 8th November, 1955.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

Chest Diseases

Castle Hill Sanatorium, Cottingham, East Yorks (220 Beds) (resident).

General Medicine

Regional Rheumatism Centre, Harrogate (240 Beds) (9 sessions), and the Rheumatism Clinic, General Infirmary at Leeds (2 sessions). Resident at Royal Bath Hospital, Harrogate.

General Surgery

(*a*) Hull Royal Infirmary (80 general surgical beds) and other hospitals in the Hull A Group. Non-resident. Includes additional duties in Casualty Department.

(*b*) St. James's Hospital, Leeds (140 general surgical beds).

Obstetrics and Gynæcology

(*a*) Leeds A Group. Duties to alternate (6-month periods) between St. Mary's Hospital, Leeds (109 obstetric beds), and St. James's Hospital, Leeds (74 obstetric and 52 gynæcological beds). Resident. Recognised for M.R.C.O.G.

(*b*) Wakefield A and B Groups (with occasional duties in Pontefract and Goole Groups). Non-resident. Offers good experience but is not at present recognised by the R.C.O.G. for membership purposes. (Aggregate of 120 obstetric and 50 gynæcological beds.)

(*c*) Dewsbury, Batley and Mirfield Group (resident). Not yet recognised for M.R.C.O.G. but offers good experience. (Aggregate of 90 obstetric and 30 gynæcological beds.)

Otolaryngology

Hull Royal Infirmary and associated hospitals (50 E.N.T. beds) (non-resident).

Psychiatry

(*a*) Menston Hospital, near Leeds (2500 Beds) (resident).

(*b*) De la Pole Hospital, Willerby (1175 Beds), and associated clinics (resident or non-resident).

(*c*) Broadgate Hospital, Beverley (600 Beds). Accommodation for single person. Resident or non-resident.

If desired, facilities for attendance at the Leeds University will be provided if successful candidates are studying for the D.P.M.

Thoracic Surgery

Duties at the Thoracic Surgical Units at the Bradford Royal Infirmary and The Hospital, Middleton. (Aggregate of 65 Beds for both non-tuberculous and tuberculous cases.) Non-resident.

Applications, stating age, qualifications and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 3rd November, 1955.

LEEDS REGIONAL HOSPITAL BOARD. Senior Registrar vacancies.

Anæsthetics

Hull A Group of hospitals with additional duties as required in the Hull B and East Riding Groups. Non-resident.

Chest Diseases

Duties mainly at Killingbeck Hospital, Leeds (225 Beds, including surgical cases), with minor duties at associated hospitals and clinics. Married quarters available.

Obstetrics and Gynæcology

Duties mainly at St. James's Hospital, Leeds (74 obstetric and 24 gynæcological beds), and St. Mary's Hospital, Leeds (109 obstetric beds). Consultant staff associated with University and Teaching Hospital.

Psychiatry

(*a*) 5 sessions as Trainee Specialist in Child Psychiatry at the University Department of Psychiatry at the General Infirmary at Leeds and the remainder of the time in mental deficiency at the Westwood Hospital, Bradford, and associated colonies. Accommodation available for a single person. May be non-resident, in which case the person appointed should reside in Bradford.

(*b*) Menston Hospital, Menston, near Leeds (2500 Beds), and associated clinics. Non-resident.

(*c*) Storthes Hall Hospital, Kirkburton, near Huddersfield (2600 Beds), and associated clinics. Non-resident.

Candidates for any of these appointments must hold the D.P.M. or equivalent qualification. In appointments (*b*) and (*c*) the successful candidate will undertake 2 clinical sessions (which may include research) in association with the Department of Psychiatry of the University.

Applications, stating age, qualifications and details of appointments held, showing dates, with names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 17th November, 1955.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. HOUSE OFFICER—Senior or Junior (pre- or post-registration)—required for Department of Urology. Post tenable for 6 months from 1st November, 1955. Salary according to grade. Terms and conditions of service for hospital medical staff apply.

Applications, giving age, qualifications, previous posts (if any) with dates, and 3 names for reference, to be sent to the Secretary to the Board.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. Applications are invited for the following pre-registration appointments which are tenable for 6 months from 1st November, 1955.

HOUSE PHYSICIAN to the Dermatological Department.

HOUSE SURGEON to the Ophthalmology Department.

Terms and conditions of service for hospital medical staff apply.

Applications, with details of age, education, qualifications, previous posts (if any) with dates, should be sent to the Secretary to the Board as soon as possible.

LEEDS. THE UNITED LEEDS HOSPITALS. Applications are invited for the post of RESIDENT MEDICAL OFFICER at the General Infirmary at Leeds. The post is of Registrar status and will be tenable for 1 year in the first instance from 1st January, 1956.

Applications, stating age, qualifications, previous posts with dates, together with the names of 3 referees, should be forwarded not later than 12th November, 1955, to the Sub-Dean, School of Medicine, Leeds, 2.

LEEDS. UNITED LEEDS HOSPITALS LEEDS REGIONAL HOSPITAL BOARD. REGISTRAR in Thoracic Surgery. First year normally at the Regional Thoracic Centre, Pinderfields General Hospital, Wakefield (56 Beds), which is under the charge of the Consultants to the Teaching Hospital. Second year at the General Infirmary at Leeds. Married quarters may be available at Pinderfields Hospital.

Applications, stating age, qualifications and details of appointments held, showing dates, with names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 17th November, 1955.

LEICESTER ISOLATION HOSPITAL AND CHEST UNIT, Groby-road, LEICESTER. (328 Beds.) Applications are invited for the appointment of RESIDENT SENIOR HOUSE OFFICER (surgical). Salary £745 p.a., less £150 p.a. residential emoluments. The appointment is tenable for 6 months and may be extended for a further period of 6 months. Experience will be gained in all branches of thoracic surgery, including cardiac surgery. The post is recognised for the Final Fellowship.

Applications, giving age, qualifications, dates, &c., and copies of 2 recent testimonials, to be forwarded as soon as possible to the Department of Thoracic Surgery, Leicester Isolation Hospital and Chest Unit.

LINCOLN. COUNTY HOSPITAL. Locum Tenens House PHYSICIAN required at the above Hospital for the period 1st December, 1955–31st March, 1956.

Applications, giving full particulars, should be forwarded to—
R. W. HOWICK, Esq., Group Secretary.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. The following staff are required :—

Park Hospital, Davyhulme (General Hospital—433 Beds)

1 SENIOR HOUSE OFFICER (general surgery), vacant mid-November.

1 NON-RESIDENT SECOND ASSISTANT CLINICAL PATHOLOGIST (Senior House Officer grade), now vacant.

1 HOUSE OFFICER (general surgery). Pre-registration post. Recognised for F.R.C.S. Vacant November.

Eccles and Patricroft Hospital (General Hospital—48 Beds)

1 SENIOR HOUSE OFFICER required. The work of the Hospital is mainly surgical. There is a busy Outpatient Department. Now vacant.

Forms from Secretary, Park Hospital, Davyhulme.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for the post of REGISTRAR in Orthopædic Surgery, to the Blackpool and Fylde Group of hospitals, with main duties at Victoria Hospital, Blackpool. Post recognised by Royal College of Surgeons for unspecified training (6 months).

Applications, together with names and addresses of 2 referees, should be sent to the Group Secretary, Blackpool and Fylde Hospital Management Committee, Victoria Hospital, Blackpool.

MANCHESTER REGIONAL HOSPITAL BOARD invite applications for REGISTRAR in Psychiatry (resident or non-resident) for duties in the Wigan and Leigh Group. The person appointed will assist the Consultant Psychiatrist at consultative clinics, and with inpatient treatments, &c. The main centre is at Billinge Hospital where there is an active Psychiatric Unit with all modern treatments. Over 300 admissions annually. Good training facilities are available for anyone desiring to specialise in psychiatry. The post is recognised for D.P.M.

Applications, together with names of 2 referees, to the Secretary, Wigan and Leigh Hospital Management Committee, Knowsley House, Wigan.

MANCHESTER. UNITED MANCHESTER HOSPITALS. SAINT MARY'S HOSPITALS, MANCHESTER. Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics. Applicants must have had previous hospital experience in general medicine and surgery, and in obstetrics. The post is recognised for purposes of the M.R.C.O.G. examination. The duties involve clinical responsibility for mothers and babies, and supervision of the work of pre-registration House Officers is also included. The appointment is for 12 months from 1st January, 1956. National scale.

Application forms may be obtained from the undersigned and returned not later than 14th November, 1955.

A. R. WISE, General Superintendent.

Saint Mary's Hospitals, Whitworth Park, Manchester, 13.

MANCHESTER, 20. WITHINGTON HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of SENIOR HOUSE OFFICER (resident or non-resident) to the Geriatric Department, vacant immediately. Duties are primarily in the active-medical wards. Excellent experience is available in the Unit, which has been developed on modern lines and has available full general hospital facilities.

Applications, stating age, qualifications, present post, experience, and the names of 2 referees, to be forwarded to the Group Secretary at the Hospital immediately.

MANCHESTER. WYTHENSHAWE HOSPITAL. South MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (plastic surgery) with 3 sessions per week in general surgery at the above Hospital which is a General Hospital with 75 plastic surgery beds. Post vacant immediately.

Applications, with full details, to the Group Secretary, Withington Hospital, Manchester, 20.

MANCHESTER (near). ALTRINCHAM GENERAL HOSPITAL AND ANNEXE. (130 Beds.) NORTH AND MID-CHESHIRE HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (surgical). This appointment affords excellent experience to suitably qualified candidates. Post recognised under F.R.C.S. regulations.

Applications to Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

MANCHESTER (near). PRESTWICH (MENTAL) HOSPITAL. There are vacancies at above Hospital for a JUNIOR HOSPITAL MEDICAL OFFICER and a SENIOR HOUSE OFFICER. Single quarters available. All modern treatments are practised and study facilities granted.

Applications, giving full personal details and the names and addresses of 2 referees, should be sent to the Medical Superintendent, Prestwich Hospital, P.O. Box No. 1, Prestwich, near Manchester, not later than Saturday, 5th November, 1955.

MAIDSTONE. KENT COUNTY OPHTHALMIC AND AURAL HOSPITAL. (113 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE SURGEON in the Ophthalmic Department of the above Hospital. The Hospital is recognised by the Examining Boards for the F.R.C.S. and the D.O. Appointment will be for 12 months. Salary £745 a year, less £150 a year for residential emoluments.

Applications should be forwarded as soon as possible to the Administrative Officer, Kent County Ophthalmic and Aural Hospital, Church-street, Maidstone.

MAIDSTONE. WEST KENT GENERAL HOSPITAL. (141 Beds.) MID-KENT HOSPITAL MANAGEMENT COMMITTEE. CASUALTY OFFICER (Senior House Officer). Recognised for F.R.C.S. Salary £745 a year, less £150 a year for board and lodging.

Applications to the Administrative Officer at the Hospital as soon as possible.

NEWCASTLE REGIONAL HOSPITAL BOARD. St. GEORGE'S HOSPITAL, MORPETH. (1200 Beds.) SENIOR REGISTRAR PSYCHIATRIST (resident), whole-time. Candidates should normally have previous experience in psychiatry, but applications will be considered from candidates with no previous practical experience in psychiatry who hold a higher medical qualification, have had wide experience in general medicine and intend to obtain a D.P.M. and specialise in psychiatry. Arrangements can be made for the person appointed to take the necessary course of study for the Durham D.P.M. A small 3-roomed, furnished or unfurnished, flat is available. Appointment for 1 year initially and subject to annual review up to 4 years duration. Further particulars from Medical Superintendent.

Applications, with names and addresses of 3 referees, to Regional Psychiatrist, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWCASTLE REGIONAL HOSPITAL BOARD. Sunderland AREA HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR OBSTETRICIAN AND GYNÆCOLOGIST (whole-time). Post recognised for M.R.C.O.G.

Applications, with names and addresses of 3 referees, to be forwarded to Senior Administrative Medical Officer, Newcastle Regional Hospital Board, Walker Gate Hospital, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NEWMARKET GENERAL HOSPITAL, Newmarket, SUFFOLK. Applications invited for the post, now vacant, of SENIOR HOUSE OFFICER (orthopædic and casualty duties).

Applications, with 3 testimonials, to the Physician-Superintendent.

NEWPORT, MONMOUTHSHIRE. ROYAL GWENT HOSPITAL. (260 Beds. Recognised F.R.C.S.) SENIOR HOUSE OFFICER required for Casualty Department, early November. Resident or non-resident. This is the Group's base Hospital, and all medical and surgical emergencies are admitted through casualty, which is under the full-time charge of a Senior Hospital Medical Officer, and there is also another Senior House Officer. A new department with excellent facilities has recently been opened. Post recognised F.R.C.S. for 6 months, and tenable 6 or 12 months as desired. Salary £745, less £125 for board-residence, if resident.

Write, quoting 2 referees, to T. A. JONES, Group Secretary, 64, Cardiff-road, Newport, Mon.

NOTTINGHAM (near). SAXONDALE HOSPITAL, RADCLIFFE-ON-TRENT, near NOTTINGHAM. (Recognised for D.P.M. examination.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time REGISTRAR in Psychiatry required. Single accommodation available. Post vacant 8th January, 1956. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 7th November, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

NOTTINGHAM. CITY HOSPITAL. (804 Beds.) Applications are invited for the post of SENIOR HOUSE OFFICER to the Department of Thoracic Surgery. Post vacant 1st December, 1955. Salary £745 p.a., less £150 p.a. for residential emoluments. The appointment will be for 1 year.

Applications, stating age, nationality, qualifications, and experience, together with copies of not more than 3 testimonials, to be submitted immediately to the Hospital Secretary, City Hospital, Hucknall-road, Nottingham.

OXFORD. UNITED OXFORD HOSPITALS. Applications invited for the post of EMERGENCY OFFICER in the United Oxford Hospitals for 2 months with effect from 1st December, 1955. Post graded as Senior House Officer for suitable applicant.

Applications, stating age, qualifications, and experience, together with the names of 2 referees, to Administrator, Radcliffe Infirmary, Oxford, not later than 14th November, 1955.

PLYMOUTH ISOLATION HOSPITAL. Plymouth Special HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER from Male registered medical practitioners who have been qualified for 1 year and who have had a minimum of 1 years hospital experience. The applicant should preferably be able to drive a car. The duties, in 2 departments, will be chiefly in connection with infectious and venereal diseases, the former including a substantial proportion of cases in children. The varied clinical work, including acute medical cases and early pulmonary tuberculosis, provides valuable experience, particularly to those reading for a higher medical degree. The post is at present non-resident and the appointment will be for 1 year. There is an immediate vacancy.

Applications, together with copies of 3 recent testimonials, should be sent to the Group Secretary, Plymouth Special Hospital Management Committee, 8, Nelson-gardens, Stoke, Plymouth, as soon as possible.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL.

HOUSE SURGEON (pre-registration post), vacant 1st December, 1955. Devonport Section.

HOUSE PHYSICIANS (pre-registration posts), 2 vacancies 1st January, 1956. Freedom Fields Section.

HOUSE SURGEONS (pre-registration posts), 2 vacancies 1st January, 1956. Recognised for the F.R.C.S. Freedom Fields Section.

PÆDIATRIC HOUSE PHYSICIAN, vacant 1st January, 1956. Recognised for the D.C.H. Freedom Fields Section.

HOUSE SURGEONS (pre-registration posts), vacancies 12th December, 1955, 1st and 11th January, 1956. Recognised for the F.R.C.S. Greenbank Road Section.

HOUSE PHYSICIANS (pre-registration posts), 2 vacancies 1st January, 1956. Greenbank Road Section.

Applications, stating age, nationality, qualifications, and experience, with names of 3 referees, to be sent to—

ARTHUR R. CASH, Group Secretary, Plymouth,
South Devon and East Cornwall General Hospital Group.
7, Nelson-gardens, Stoke, Plymouth.

PONTEFRACT GENERAL INFIRMARY. Resident CASUALTY OFFICER required. Graded Senior House Officer. Recognised for Fellowship. Married accommodation available. Post vacant as from 20th November, 1955.

Apply Secretary, Great Northern House, Salter-row, Pontefract, Yorks.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

St. Mary's Hospital (130 surgical beds)

HOUSE SURGEON (pre-registration), vacant 1st November, 1955.

Applications, stating age, experience and qualifications, together with names of 2 referees, should be forwarded as soon as possible to L. C. ROGERS.

35, Grove-road South, Southsea.

PORTSMOUTH. EYE AND EAR HOSPITAL. South WEST METROPOLITAN REGIONAL HOSPITAL BOARD. PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of NON-RESIDENT OPHTHALMIC REGISTRAR at the above Hospital, vacant now. Preference will be given to candidates holding a specialist qualification.

Forms of application may be obtained from the Acting Group Secretary, Portsmouth Group Hospital Management Committee, 35, Grove-road South, Southsea, which should be returned to him duly completed on or before 7th November, 1955. Canvassing will disqualify, but it is hoped that candidates will visit the Hospital by arrangement with the Acting Group Secretary.

PORTH AND DISTRICT HOSPITAL, Porth, Rhondda. (110 Beds—visited regularly by Consultants from Cardiff Royal Infirmary.) PONTYPRIDD AND RHONDDA HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER (surgical). Maximum tenure of appointment 3 years but holder may apply for reappointment.

Applications, stating age, qualifications and experience, together with copies of 2 recent testimonials, to be sent as soon as possible to the Group Secretary, Courthouse-street, Pontypridd.

POOLE GENERAL HOSPITAL, Poole, Dorset. Bourne-MOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. 2 HOUSE SURGEONS (pre-registration) required. 1 post vacant 12th November, 1955, and the second 3rd December, 1955. The Hospital is recognised for the F.R.C.S. and F.R.C.S.E.

Applications to the Hospital Secretary.

RAMSGATE. GENERAL HOSPITAL. (101 Beds.) HOUSE SURGEON. Approved pre-registration post. Salary at the rate of £425–£525 p.a., according to experience, less £125 for residential emoluments.

Applications, with copies of testimonials, to Hospital Secretary.

REDHILL. EAST SURREY HOSPITAL, Shrewsbury-road, REDHILL, SURREY. (139 Beds.) SENIOR HOUSE OFFICER (surgical), Male, required immediately.

Apply to the Hospital Secretary.

ROCHDALE AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. HOUSE OFFICER (surgery) post vacant at Rochdale Infirmary early December. Pre-registration candidates eligible for this post which is recognised for 6 months. F.R.C.S. experience.

Apply at once to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale.

ROCHDALE AND DISTRICT HOSPITAL MANAGE-MENT COMMITTEE. BIRCH HILL HOSPITAL. HOUSE OFFICER (obstetrics and gynæcology), vacant mid-December. Pre-registration post of 6 months duration. Recognised for D.Obst.R.C.O.G.

Apply to Group Secretary, Central Offices, Birch Hill Hospital, Rochdale, at once.

ROMFORD, ESSEX. RUSH GREEN HOSPITAL. REGISTRAR required for the Regional Poliomyelitis Unit (30 Beds), the vacancy being for a minimum period of 3 months commencing mid-November. The post affords excellent opportunity for the study and care of respiratory and bulbo spinal poliomyelitis with different types of modern apparatus.

Applications as soon as possible to the Medical Superintendent.

ROMFORD. VICTORIA HOSPITAL. (99 Beds.) Temporary SURGICAL REGISTRAR (Male) required from 11th November, 1955.

Applications should be forwarded to Secretary, Romford Group Hospital Management Committee, at Oldchurch Hospital, Romford, as early as possible.

SALISBURY GENERAL HOSPITAL. Applications are invited for the appointment of RESIDENT HOUSE SURGEON/HOUSE PHYSICIAN to run consecutively in this order from 1st January, 1956, for a period of 6 months in each post. The post is open to pre-registration candidates.

Apply, naming 2 referees, to Group Secretary, Salisbury Group Hospital Management Committee, Odstock Hospital, Salisbury.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments, which will be for 1 year in the first instance :—

SENIOR REGISTRAR in Bacteriology based at the Victoria Infirmary, Glasgow, with duties in Ayrshire, and elsewhere within the Region as may be required.

REGISTRAR in Ophthalmology based at the Ophthalmic Institution, Glasgow.

REGISTRAR in Ophthalmology based at the Eye Infirmary, Glasgow.

REGISTRAR in Medicine based at the Western Infirmary, Glasgow.

REGISTRAR in Bacteriology based at the Royal Infirmary, Glasgow.

These appointments are subject to the National Health Service (Scotland) superannuation regulations.

Applications (12 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, by 12th November, 1955.

SCUNTHORPE. WAR MEMORIAL HOSPITAL. (267 Beds.) Vacancy for HOUSE SURGEON (Senior House Officer) end of November. Post offers excellent experience.

Applications, naming 2 referees, to Group Secretary, Scunthorpe Hospital Management Committee.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. CHILDREN'S HOSPITAL UNIT. Applications invited for the non-resident post of CASUALTY OFFICER (Senior House Officer grade) at the above Hospital ; vacant 1st January, 1956.

Applications, stating age, qualifications and experience, with the names of 2 referees, should be sent not later than 10th November, 1955, to the Superintendent, The Children's Hospital, Western Bank, Sheffield, 10.

SHEFFIELD. CITY GENERAL HOSPITAL. (Recognised for the F.F.A.R.C.S. examination.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT REGISTRAR (anæsthetics) required at the above Hospital. This is a large general hospital with a Department of Thoracic Surgery, a Regional Cardiological Centre and a Professorial Gynæcological Unit. The successful candidate to reside at the Hospital when "on call." Post vacant 3rd January, 1956. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 7th November, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD. CITY GENERAL HOSPITAL. (Recognised for Final Fellowship examination.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT SURGICAL REGISTRAR required at the above Hospital. This is a large Hospital with teaching affiliations. Post vacant 1st January, 1956. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 7th November, 1955, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time SENIOR REGISTRAR in Psychiatry required for the Pastures Hospital, Mickleover, near Derby. D.P.M. essential. House available. Appointment for 1 year in the first instance, reviewable annually. Opportunity for research and experience in those special branches of psychiatry available in the Hospital area.

Application forms and details from Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, 10. Forms to be returned by 7th November, 1955.

SHOREHAM-BY-SEA, SUSSEX. SOUTHLANDS HOS-PITAL. (453 Beds.) WORTHING GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the whole-time post of MEDICAL REGISTRAR with duties in the general medical wards and Pædiatric Unit. The post will be vacant from 31st January, 1956.

Forms of application are obtainable from the undersigned.

A. V. OAKTON, Group Secretary,
Worthing Group Hospital Management Committee.
129, Brighton-road, Worthing, Sussex.

SOUTHAMPTON AND WINCHESTER HOSPITAL MANAGEMENT COMMITTEES. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications invited from persons with experience of pædiatrics for the post of REGISTRAR (non-resident) ; vacant 1st February, 1956 ; to be attached to the Southampton Children's Hospital and to undertake work with an area team in the Southampton and Winchester Hospitals. Possession of M.R.C.P. an advantage. Candidates may visit the hospitals concerned by prior arrangement if they so desire.

Forms of application, may be obtained from the undersigned and must be returned not later than 9th November, 1955.

FRANK JENNINGS, Group Secretary,
Southampton Group Hospital Management Committee.
Bullar-street, Southampton.

SOUTHAMPTON CHEST HOSPITAL. South West METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR SURGICAL REGISTRAR (Dominions status) required for Thoracic Unit (80 surgical beds) at above Hospital. Candidates should possess higher qualifications and should have had previous experience of thoracic surgery. This post will be for a maximum of 2 years and is intended for candidates from overseas (particularly from the Commonwealth), who are already of Senior Registrar status who wish to undertake a period of final training here before returning to their own country. The Hospital may be visited, if desired, by prior arrangement.

Application forms, obtainable from the undersigned, should be returned by 9th November, 1955.

FRANK JENNINGS, Group Secretary,
Southampton Group Hospital Management Committee.
Bullar-street, Southampton.

SOUTHAMPTON GENERAL HOSPITAL. (471 Beds—87 surgical.) 2 HOUSE SURGEONS required end of November and mid-December, 1955. Posts tenable for 6 months. Both recognised for F.R.C.S. and Pre-registration Service.

Applications, with copies of testimonials, should be forwarded as soon as possible to the Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTHAMPTON. ROYAL SOUTH HANTS HOS-PITAL. (278 Beds. Recognised for F.R.C.S.) RESIDENT HOUSE SURGEON required immediately. Pre-registration candidates eligible.

Applications, with copies of testimonials, should be forwarded to the Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTH EAST METROPOLITAN REGIONAL HOS-PITAL BOARD. Applications are invited for an appointment as Whole-time SENIOR REGISTRAR in Psychiatry to fill a vacancy in the approved trainee establishment at Hellingly Hospital, Hailsham, Sussex. Candidates should possess the D.P.M. and have had wide experience in general medicine. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance. The post will include opportunities for gaining further experience in a wide range of psychiatry including attendance at adult outpatient clinics. A furnished flat will be available as married quarters, if required.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 3 referees, should be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 12th November, 1955.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Psychiatric Registrars Training Scheme. Applications are invited for the appointment of REGISTRAR for 6 months periods at the hospitals of St. Ebba's, Horton, Long Grove, and The Manor in succession. Wide experience is available in all forms of psychosis, in neurosis and in mental deficiency under modern methods of treatment. Special experience may be gained in the Mott Clinic for General Paralysis, St. Ebba's Juvenile Unit and in Mapother House, Long Grove, for acute Psychosis; also in the associated Observation Wards and Outpatient Departments. The appointment will be tenable from January, 1956. Salary &c., in accordance with the agreed terms and conditions of service for hospital medical staff. For residents appropriate charges are made for full residential amenities. Candidates may visit the hospitals by appointment with the Physicians-Superintendent.

Application forms may be obtained from the Group Secretary, St. Ebba's and Belmont Group Hospital Management Committee, Group Office, Belmont Hospital, Brighton-road, Sutton, Surrey, and completed forms (5 copies) should be returned to him within 2 weeks of the appearance of this advertisement.

SOUTH EAST NORTHUMBERLAND HOSPITAL MANAGEMENT COMMITTEE. RESIDENT MEDICAL OFFICER (Tuberculosis Service) required for duties at the Moor Park and Hadrian Hospitals. Junior Hospital Medical Officer or Senior House Officer grade according to experience.

Applications, with names of 2 referees, to Group Secretary, Preston Hospital, North Shields, as soon as possible.

SOUTHPORT PROMENADE HOSPITAL. Senior House OFFICER (Physician). This resident post vacant 16th November.

Apply, stating age, qualifications, experience and nationality with 2 copy testimonials, to Group Secretary, Southport and District Hospital Management Committee, Promenade Hospital, Southport.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. WINDSOR GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE OFFICER (casualty) required, 1 of 2, for busy Casualty Department. Experience provided in orthopædic and plastic cases.

Applications, stating age and qualifications together with copies of 2 testimonials, to Hospital Secretary.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. WINDSOR GROUP HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON required, pre-registration post, vacant 9th December.

Applications, stating age and qualifications, to Hospital Secretary, by 14th November.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) HOUSE SURGEON (House Officer grade) required for 1 of the 2 general surgical teams. Recognised for the F.R.C.S. Post vacant approximately 8th December, 1955, and tenable for 6 months. Preference given to candidates seeking pre-registration posts under the Medical Act, 1950.

Applications to Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans.

STOKE-ON-TRENT. CITY GENERAL HOSPITAL. HOUSE OFFICER (general surgery) required. Recognised F.R.C.S. and pre-registration.

Applications to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. (455 Beds.) SENIOR HOUSE OFFICER (E.N.T.) required, vacant now. Recognised F.R.C.S.

Applications to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent, as soon as possible.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. SENIOR HOUSE OFFICER (anæsthetics) required. Recognised D.A. Recognition F.F.A.R.C.S. applied for. Previous anæsthetic experience desirable but not essential.

Detailed applications to Hospital Management Committee Secretary, Princes-road, Stoke-on-Trent.

STROUD GENERAL HOSPITAL, Stroud, Gloucestershire. GLOUCESTER, STROUD AND THE FOREST HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required mainly for surgery. Post, which is vacant 1st December, offers favourable experience for those wishing to enter general practice.

Applications, naming 2 referees, to Hospital Secretary.

SUNDERLAND. THE ROYAL INFIRMARY. Casualty DEPARTMENT. A vacancy will occur in mid-November for a CASUALTY OFFICFR (Senior House Officer grade). The Casualty Officer is to take charge of the Casualty Department, under the direct supervision of a Senior Surgeon. The post is recognised for the F.R.C.S.

Applications, with names of 2 referees, to the Hospital Secretary, Royal Infirmary, Sunderland.

SWANSEA. MOUNT PLEASANT HOSPITAL. (238 Beds.) GLANTAWE HOSPITAL MANAGEMENT COMMITTEE. Registered medical practitioners are invited to apply for the resident appointment of JUNIOR HOSPITAL MEDICAL OFFICER (Female) for work in the Medical and Surgical Departments, and in the Chronic Sick Wards of the above Hospital.

Applications, stating age, experience, and qualifications, with copies of 2 recent testimonials, should be addressed to the Hospital Secretary.

WATFORD MATERNITY HOSPITAL, King-street, WATFORD. (58 Beds.) Applications are invited for the residential post of SENIOR OBSTETRICS OFFICER for duties commencing 1st December, 1955. Salary £745 p.a., less £155 p.a. for residential emoluments. Hospital recognised for M.R.C.O.G. examination.

Applications, giving full details of age, nationality, qualifications, present and previous appointments with dates, and copies of 3 testimonials, should be sent to the Hospital Secretary as soon as possible after the appearance of this advertisement.

WAKEFIELD. HOSPITAL MANAGEMENT COMMITTEE NO. 9 WAKEFIELD A GROUP. Applications are invited for the appointment of a RESIDENT or NON-RESIDENT ANÆSTHETIST (Junior Hospital Medical Officer grade) for work in all branches of surgery in the Wakefield A and Wakefield B Groups, including thoracic anæsthesia at the Leeds Regional Thoracic Centre at Pinderfields Hospital, Wakefield. This post is recognised for the D.A. and F.F.A.R.C.S. qualification, and becomes vacant on 1st December, 1955. The salary and conditions of service being in accordance with the National Health Service regulations.

Applications should be made to W. READ, Group Secretary, 113, Northgate, Wakefield.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. Applications are invited for appointment of SENIOR HOUSE OFFICER in the Gynæcological Department. Salary £745 p.a. Accommodation provided at charge of £125 p.a.

Address written applications, giving full particulars, and 2 names and addresses for reference, to—

W. BOWRING, Group Secretary.
Victoria Chambers, Wood-street, Wakefield.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL AND CLAYTON HOSPITAL. Applications invited for joint appointment of Locum Tenens REGISTRAR in Obstetrics and Gynæcology for the above hospitals. Salary £17 10s. a week.

Address applications, giving full personal particulars and details of experience, &c., to—

W. BOWRING, Group Secretary.
Victoria Chambers, Wood-street, Wakefield.

WARRINGTON INFIRMARY. (172 Beds.) Applications are invited for a vacancy at the above Hospital for a RESIDENT HOUSE SURGEON (Male or Female). Recognised for pre-registration. Salary will be £425–£525 p.a., less a deduction of £125 for full residential emoluments.

Applications should be sent to—

H. L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancashire.

WEST BROMWICH AND DISTRICT GENERAL HOSPITAL. (144 Beds.) HOUSE SURGEON (pre-registration), vacant immediately.

Applications, with 3 recent testimonials, to Group Secretary, West Bromwich and District Hospital Management Committee, Edward-street, West Bromwich.

WIGAN. ROYAL ALBERT EDWARD INFIRMARY. HOUSE PHYSICIAN (Senior House Officer grade) for duty in the General Medical and Pædiatric Departments at Wigan Infirmary.

Applications, with names of 2 referees, to the Secretary, Royal Albert Edward Infirmary, Wigan.

WIGAN. ROYAL ALBERT EDWARD INFIRMARY AND WHELLEY HOSPITAL. (279 Beds.) SENIOR HOUSE OFFICER (medicine) required. Post vacant 1st December, 1955. Good experience for higher qualifications.

Applications to Secretary, Wigan Infirmary.

WINDSOR. KING EDWARD VII HOSPITAL. House SURGEON in General Surgery required (Male or Female) for post vacant 1st January. Recognised for F.R.C.S. Preference given to persons seeking a pre-registration post. Applicants required to be members of a Medical Protection Society.

Applications, stating age, nationality, qualifications with dates, and copies of recent testimonials, to Hospital Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. 2 House PHYSICIANS required (Male or Female). Posts vacant 8th and 15th December. Preference given to persons seeking a pre-registration post. Applicants required to be members of a Medical Protection Society.

Applications, stating age, qualifications with dates, nationality, and copies of 3 recent testimonials, to Hospital Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. House SURGEON in General and Orthopædic Surgery required (Male or Female) for post vacant 3rd January. Recognised for F.R.C.S. Preference given to persons seeking a pre-registration post. Applicants required to be members of a Medical Protection Society.

Applications, stating age, qualifications with dates, nationality, and copies of recent testimonials, to Hospital Secretary.

WOKINGHAM. PINEWOOD HOSPITAL. Registrar in Diseases of the Chest required at above Hospital which has 218 Beds and contains a Thoracic Surgical Unit. Post gives valuable experience in medical and surgical treatment of pulmonary tuberculosis and is suitable for a candidate working for higher qualification. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, Windsor Group Hospital Management Committee, Alma-road, Windsor, by 11th November.

WOLVERHAMPTON GROUP.

The Royal Hospital (an Associated Hospital of the University of Birmingham Medical School)

SENIOR HOUSE OFFICER or HOUSE OFFICER (Fracture and Orthopædic Department), vacant now.

New Cross Hospital

HOUSE OFFICER (general medicine), pre-registration post, vacant now.

Apply Group Secretary, Royal Hospital, with copies of testimonials.

WOLVERHAMPTON GROUP.

The Royal Hospital

JUNIOR PATHOLOGIST required. Salary in Junior Hospital Medical Officer grade. Comprehensive service offering wide experience and training. Resident post vacant 1st January, 1956. Candidates may visit Pathologist.

Applications by 7th November to Group Secretary, The Royal Hospital, Wolverhampton.

WORTHING HOSPITAL, Lyndhurst-road, Worthing. (210 Beds—General.) The vacancy of HOUSE SURGEON will occur in mid-November, 1955.

Applications from either registered medical practitioners, or pre-registration candidates, stating age, qualifications, experience, nationality, and enclosing copies of 2 recent testimonials, to be forwarded to the Hospital Secretary as soon as possible.

A. V. OAKTON, Group Secretary,
Worthing Group Hospital Management Committee.

WREXHAM WAR MEMORIAL HOSPITAL. (230 Beds.) WREXHAM, POWYS AND MAWDDACH HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER (resident or non-resident) for the Casualty Orthopædic Department of the above Hospital. The appointment is recognised for the Diploma of F.R.C.S. (Eng. and Edin.) and is subject to a limited tenure of 2 years, which may be reviewed at the end of that period. Salary £775–£50–£1075 p.a., Whitley Council conditions of service.

Applications, giving details of age, qualifications, and previous experience, together with copies of 2 recent testimonials, should be sent to WILLIAM JONES, Secretary, Wrexham, Powys and Mawddach Hospital Management Committee, Maelor General Hospital, Wrexham, as soon as possible.

CHANNEL ISLANDS, JERSEY. GENERAL HOSPITAL. Applications are invited for the post of RESIDENT SURGICAL OFFICER at the above Hospital. Previous experience is essential The Hospital has 200 Beds and is recognised as a training Hospital for the F.R.C.S. The post is vacant on 1st January, 1956. The appointment is for 6 months in the first instance, but is renewable for a further 6 months. Salary £850 p.a., less £125 for residential emoluments.

Applications to be submitted not later than 18th November, 1955, to the President, Public Health Committee, General Hospital, Jersey, C.I.

Public Appointments

ROYAL AUSTRALIAN AIR FORCE. For appointment of Medical Officers see page 35.

BIRMINGHAM. CITY OF BIRMINGHAM EDUCATION COMMITTEE. Applications are invited from registered medical practitioners (Men or Women) for appointment as SCHOOL MEDICAL OFFICER in the School Health Service. The possession of a D.P.H. or D.C.H. will be an advantage. Salary in accordance with Whitley Council scale of £975–£50–£1375 p.a. Appointment is subject to the appropriate superannuation act and to the passing of a medical examination.

Forms of application obtainable from the undersigned (stamped addressed envelope) must be returned not later than 21st November, 1955. Canvassing disqualifies.

E. L. RUSSELL, Chief Education Officer.
Queen's College Chambers, 38A, Paradise-street,
Birmingham, 1.

DUBLIN BOARD OF ASSISTANCE invites applications for appointment to the following resident positions in the Department of Pathology at St. Kevin's Hospital.

(*a*) REGISTRAR in Pathology.
(*b*) SENIOR RESIDENT MEDICAL OFFICER in Pathology.
(*c*) 2 JUNIOR HOUSE PHYSICIANS (pathology).

Salary: (*a*) £650 p.a.; (*b*) £500 p.a.; (*c*) £325 p.a. Full residential emoluments are provided in each case. The period of appointment is 1 year for posts (*a*) and (*b*) and 6 months for post (*c*), renewable for further periods in all cases.

Full particulars and application forms may be obtained from the Establishment Department at 1, James's-street, Dublin. Completed application forms must be returned not later than 7th November, 1955.

SEAMUS O. MURCHADHA, Chief Executive Officer.
18th October, 1955.

DUBLIN. CORPORATION OF DUBLIN. Applications are invited from medical practitioners for the post of Temporary REGISTRAR in connection with Chest Surgery at the James Connolly Memorial Hospital, Blanchardstown, co. Dublin. Salary: £800 p.a. inclusive of temporary bonus, subject to a deduction of £150 p.a. in respect of emoluments provided in kind.

Application forms and full particulars may be obtained from the Establishment Department, City Hall, Dublin. Latest date for receipt of applications 22nd November, 1955.

JOHN P. KEANE, City Manager and Town Clerk.
City Hall, Dublin, 12th October, 1955.

HER MAJESTY'S OVERSEA CIVIL SERVICE. Medical BRANCH—BRITISH HONDURAS. MEDICAL OFFICERS required for general duties. Appointments can be made on a permanent basis with pension (non-contributory) at the age of 55, or on short-term agreement renewable if desired. Arrangements can probably be made for doctors in the National Health Service to resign from the National Health Service but retain their superannuation rights up to 6 years and receive a gratuity (taxable) of 20% of the aggregate of their salary after their engagement. Salary scale ranges from £810 to £1200 a year at the current rate of exchange of the British Honduras dollar ($4 = £1). Private practice in district towns is permitted, but in Belize an allowance of £125 a year is payable in lieu of private practice. Quarters are available at a rental of 7½% of salary, subject to a maximum charge of £120 a year. Main items of furniture provided at rental of 6% a year of value of each item supplied. Income-tax at local rates. Free passages are provided on appointment for Officer, wife and children, not exceeding 5 persons in all. On leave, passages are provided for Officer and wife and not more than 2 children. Local leave is permissible and generous home leave is granted after each tour of from 2 to 3 years duration. Candidates must possess medical qualifications registrable in the United Kingdom.

Application forms from the Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD. 117/31/01).

HER MAJESTY'S OVERSEA CIVIL SERVICE. Medical BRANCH—KENYA. Applications are invited from doctors registered in the United Kingdom for the following posts in the Medical Department of Kenya:—

(1) MEDICAL OFFICERS for general duties. Successful candidates may be posted to any station in Kenya. During the earlier years of service an officer will be expected to carry out general medical and surgical duties including a varying amount of public health administration. In most stations, even if remote from the larger towns, it is possible for an officer to maintain interest in any particular branch of medicine or surgery to which he is attracted, and as far as possible his professional interests are taken into account when postings are made. The work of every medical officer is based on a hospital which may vary in size and facilities from a small district hospital meeting the needs of a comparatively primitive community to a large and modern provincial hospital.

(2) SCHOOL MEDICAL OFFICER to supervise the public health aspect of European, Asian and African schools with particular reference to health, education, and nutrition, together with a certain amount of clinical examinations. Preference will be given to candidates possessing a Diploma in Public Health.

Appointments can be made on a permanent basis with pension (non-contributory) at age of 55, or on short-term contract with gratuity (taxable) payable on satisfactory completion of service. Salary ranges from £1116 to £1836 a year; starting point is determined by experience and 4 extra increments are given to successful candidates possessing the M.R.C.P., F.R.C.S., D.P.H., or other approved higher qualifications. Temporary cost-of-living allowance at the rate of 10% of salary is also payable, subject to a maximum of £162 a year making gross emoluments of £1228–£1998 a year. Permanent Medical Officers are eligible to be considered at any time for promotion to super-scale posts in Kenya and other territories in medical administration or, if they possess higher qualifications and suitable experience, in specialist posts. Quarters are generally available at rental of 10% of salary. Free passages in both directions for officer and wife and up to cost of 1 adult fare for children. Taxation at local rates. Annual local leave permissible and generous home leave granted after each tour of from 40 to 48 months. Educational facilities are available.

Application forms from Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith-street, London, S.W.1 (quoting reference No. BCD.117/7/02).

GLASGOW. CORPORATION OF GLASGOW. Applications are invited for whole-time appointment of MEDICAL ASSISTANT BACTERIOLOGIST, preferably with some experience of routine bacteriology and serology, or alternatively, with a Diploma in Public Health. Salary scale £950–£50–£1300 p.a. The post is superannuable, subject to age qualification and medical examination.

Applications, stating age, qualifications, and experience, with names of 3 referees (envelope marked "Appointment of Medical Assistant Bacteriologist") should reach me by Friday, 25th November, 1955.

City Chambers, Glasgow. WILLIAM KERR, Town Clerk.

GOLD COAST LOCAL CIVIL SERVICE. Gold Coast MEDICAL SERVICE. SPECIALIST MALARIOLOGIST required by the Ministry of Health, Gold Coast, to organise treatment and anti-malaria campaigns. Candidates should be qualified doctors and have had experience of malaria control and research. Appointment is to the Gold Coast Civil Service on contract for 2 tours of 18–24 months each in the first instance with gratuity (taxable) on satisfactory completion of service. Basic salary scale would be £2400–£2700 a year. Gratuity would be payable at the rate of £37 10s. for each completed 3 months of service. Candidates in the National Health Service may leave the National Health Service but retain their superannuation rights (up to a maximum stay of 6 years). Salary, in this case, would be in the scale £1900–£2200 a year, and the gratuity 20% of the aggregate of salary. Starting-point in both salary scales is determined according to qualifications and experience. Quarters when available are provided at rents not exceeding £120 p.a. Income-tax at local rates. Free passages provided for officer, wife and up to 3 children under 13 years of age. Generous home leave is granted after each tour of 18–24 months.

Application forms from Director of Recruitment, Colonial Office, Sanctuary Buildings, Great Smith street, London, S.W.1 (quoting reference No. BCD. 117/13,021).

GOVERNMENT OF BAHRAIN. British Medical Officer (Female). Government of Bahrain Medical Department invites applications from British Women Doctors for the post of MEDICAL OFFICER to the Women's Hospital for general duties in Hospital, Outpatients and Village Dispensaries. Age 28–40. Minimum salary at age 28, £1539, rising £45 annually. No allowances. Non-contributory gratuity on retirement, or pension scheme. Private practice among Europeans only. No income-tax. Free quarters with hard furniture and car. Agreement for 2 years, renewable, with 5 months home leave on full pay and free air passages.

Applications, with 3 testimonials and photograph, should be sent to the Chief Medical Officer, Bahrain Government Hospital, Bahrain, Persian Gulf.

GOVERNMENT OF BAHRAIN. British Surgeon (Female). Government of Bahrain Medical Department invites applications from British Women Doctors, F.R.C.S. or M.R.C.O.G., for the post of SURGEON to the Women's Hospital. Age 28–40. Minimum salary at age 28, £2157, rising £45 annually. No allowances. Non-contributory gratuity on retirement, or pension scheme. Private practice among Europeans only. No income-tax. Free quarters with hard furniture and car. Agreement for 2 years, renewable with 5 months home leave on full pay and free air passages.

Applications, with 3 testimonials and photograph, should be sent to the Chief Medical Officer, Bahrain Government Hospital, Bahrain, Persian Gulf.

GOVERNMENT OF QATAR. State Medical Service. Applications are invited for the post of GOVERNMENT ANÆSTHETIST and for the post of SENIOR PUBLIC HEALTH INSPECTOR, under the State Medical Officer, Government of Qatar, Persian Gulf. Details as follows :—

Government Anæsthetist.

Qualifications : D.A. or F.F.A.R.C.S. essential.

Salary. Rs.2700=£202 10s. per Arabic month (£2430 p.a.) with annual increment of Rs.100 per month up to a maximum of Rs.3300. Gratuity : Rs.14500 on completion of contract only.

Senior Public Health Inspector.

Qualifications : Candidates must have professional qualifications recognised by the Royal Sanitary Institute. Experience commensurate with responsibility for all public health matters.

Salary. Rs.1775=£133 2s. 6d. per Arabic month (£1598 p.a.) with annual increment of Rs.75 up to Rs.2000—thereafter Rs.100 up to a maximum of Rs.2200. Gratuity : Rs.9650 on completion of contract only.

The following particulars are common to both posts :—

Probation. Probationary period of 6 months during which contract may be terminated at 3 months notice by the Government.

Contract. A 5-year contract subject to successful completion of probationary period. The employee may terminate the contract at 3 months notice after completing 1 year of service. (Note : For the Senior Public Health Inspector's post secondment from present employment would be considered.)

Accommodation. Free furnished accommodation, fuel, light, and water. Married accommodation is provided after completion of probationary period.

Leave. 6 days per completed month of duty may be taken annually.

Free Travel. On appointment, leave and termination, for applicant, wife, and children up to 18 years of age.

General. The climate is hot for about 5 months but this is offset by air-conditioning in staff houses and offices (as also in the Hospital). Very pleasant weather for the rest of the year.

No income-tax. Generous car allowance.

Applications for either of these posts, giving full details of training, experience, qualifications, age, nationality, marital status, names of 3 referees, and dated photograph, should be sent in triplicate to C. TENNANT, SONS & CO., LTD., 4, Copthall-avenue, London, E.C.2.

COMHAIRLE CONNDAE NA MIDHE. The Meath County Council invite applications for the position of Temporary REGISTRAR, Our Lady's Hospital, An Uaimh. Rate of remuneration as approved by the Department of Health.

Full details and application forms may be had from the Chief Officer, Health Offices, Meath County Council, An Uaimh, County Meath, Ireland. Latest date for receipt of completed application forms Friday, 11th November, 1955, at NOON.

LANCASHIRE COUNTY COUNCIL. Registered medical practitioners required for appointment of ASSISTANT DIVISIONAL MEDICAL OFFICERS in Administrative County Areas adjacent to Southport, Fleetwood, Preston and at Leigh Borough. Possession of D.P.H. desirable. Salary £975–£1375 p.a. Travelling and subsistence allowances where applicable.

Application forms and further particulars from County Medical Officer of Health, Serial 361, East Cliff County Offices, Preston.

SALFORD. CITY OF SALFORD. Education Committee. Applications are invited from registered medical practitioners for the post of ASSISTANT MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER (full-time or part-time). Preference will be given to candidates possessing the D.C.H. or D.P.H. The duties will consist of work mainly with the medical inspection of school-children and maternity and child welfare, but will also include such other public health work as the Medical Officer of Health and Principal School Medical Officer may direct. Salary will be within the scale £975 p.a., rising by £50 annually to a maximum of £1375 p.a. In fixing the commencing salary consideration will be given to the candidate's experience and qualifications. The appointment will be subject to the usual conditions of Local Government Service.

Forms of application may be obtained from the Director of Education, Education Office, Chapel-street, Salford, 3, to whom they should be returned as soon as possible.

R. RIBBLESDALE THORNTON, Town Clerk.

SOUTHPORT. COUNTY BOROUGH OF SOUTHPORT. Applications are invited from registered medical practitioners for the appointment of DEPUTY MEDICAL OFFICER OF HEALTH AND DEPUTY SCHOOL MEDICAL OFFICER. Applicants should possess a Diploma in Sanitary Science, Public Health or State Medicine and should have had experience in a health department. Salary scale £1187 15s. 7d.–£51 10s. 0d.–£1445 5s. 7d. plus travelling allowance on a mileage basis.

Application forms and conditions of appointment may be obtained from the Medical Officer of Health, 2, Church-street, Southport. Completed applications to be sent to the undersigned to arrive not later than 5th November, 1955, and envelopes to be endorsed " Deputy Medical Officer of Health " in the top left hand corner.

Town Hall, Southport. R. EDGAR PERRINS, Town Clerk.

ST. HELENS. COUNTY BOROUGH OF ST. HELENS. HEALTH DEPARTMENT. Applications are invited from qualified medical practitioners for the post of ASSISTANT MEDICAL OFFICER OF HEALTH (Male or Female) at a salary of £975 p.a., rising by annual increments of £50 to £1375 p.a. Recognition may be given to past Local Authority service in fixing the commencing salary. The possession of a C.P.H. or D.C.H is desirable, but not essential. Consideration for housing accommodation will be given according to the circumstances of the successful candidate.

Application forms and further particulars of appointment may be obtained from the undersigned.

G. O'BRIEN, Medical Officer of Health.

Town Hall, St. Helens, Lancs., October, 1955.

PAKISTAN HIGH COMMISSION. Applications are invited for the permanent post of MEDICAL SUPERINTENDENT (Female), Lady Aitchison Hospital, Lahore. Pay scale : Rs. 800–50–1250 p.m. plus allowances. Starting salary according to qualifications and experience (1R = 1s. 6d.). Free passages and medical treatment. Free furnished house or allowance in lieu. Contract : 5 years. Qualifications : M.R.C.O.G. or F.R.C.S. diploma, plus 5 years gynæcological experience in recognised hospital. Age limit : 40, relaxable.

Further particulars and application forms from Recruitment Officer, Education Division, Pakistan High Commission, 39, Lowndes-square, S.W.1.

General Practice

For an Executive Council post (England and Wales) apply on form E.C.16A obtainable from the council. Mark envelope " Vacancy."

BIRMINGHAM, WASHWOOD HEATH. Applications invited for VACANCY (urban) due to resignation. List approximately 2300. Residence/surgery may be available. Apply on E.C.16A not later than 12th November, 1955, to—

K. F. G. DAY, Clerk of Birmingham Executive Council.

Sutton New-road, Erdington, Birmingham, 23.

CLEVEDON, SOMERSET. Applications are invited for a VACANCY (urban) due to resignation. List approximately 1557. Residence and surgery available for purchase. Applications on Form E.C.16A before 9th November to the Clerk, Somerset Executive Council, 11, Elmhyrst-road, Weston-super-Mare, Somerset.

HORNSEY. Applications invited for Vacancy. List at present approximately 1300. Intermediate area. Premises will not be available. Apply on Form E.C.16A, before 5th November, 1955, to—

G. MADDEN, Esq., Middlesex Executive Council.

Gloucester House, Gloucester-gate, London, N.W.1.

Miscellaneous

To non-professional posts the Notification of Vacancies Order 1952 applies

The Society of Medical Officers of Health invite applications for the post of Medical Secretary (part-time). **The salary offered is within the scale £750–£1000.**

Applications, endorsed " Medical Secretary " and containing full details of the applicant's professional career, should be forwarded to the Medical Secretary, SOCIETY OF MEDICAL OFFICERS OF HEALTH, Tavistock House South, Tavistock-square, W.C.1, and must be received not later than 15th December.

Lever Brothers, Port Sunlight, Limited. Applications are invited from registered medical practitioners for the post of Medical Officer in a comprehensive Industrial Health Service at Port Sunlight, including the factories and employees of 2 neighbouring factories in the Unilever group on Merseyside, with a total industrial population of 11,000 employees. Duties will include the medical examination of applicants for employment, treatment of accidents and minor medical conditions, and the supervision of health in relation to work. Possession of the D.P.H. or D.I.H. will be an advantage ; preference will be given to candidates under 35 years of age. The commencing salary will be in accordance with qualifications and experience, but will not be less than £1400 p.a. Generous pension scheme.

Letters of application, which should include the names of 3 persons to whom reference may be made, and full details of the candidate's training and career, should be submitted by 19th November to Personnel Director, Lever Brothers, Port Sunlight, Limited, Port Sunlight, Cheshire, endorsing the envelope " Medical Officer."

Personnel/Health Services, Health Centre, Port Sunlight.

Spanish Doctor, registered 1946, requires obstetric and gynæcological post in hospital, preferably resident.—Address, No. 174, THE LANCET Office, 7, Adam-st., Adelphi, London, W.C.2.

Green-street, Mayfair. Compact residence ideally suitable for occupation of partnership with accommodation adequate for both professional and private requirements. Lease 50 years at low ground-rent £90 p.a. £7500.—Address, No. 175, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

4 rooms required by Dental Surgeon with established mainly private practice in the area Sloane-square–Temple–Harley-street.—Address, No. 173, THE LANCET Office, 7, Adam-street, Adelphi, London, W.C.2.

" Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimen of urine and £1 1s. fee. Hæmatology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone : VICtoria 0141), who are specialists in this kind of work.

Typewriting and Duplicating. First-class work at moder-ate prices by experienced medical typists.—SYBIL RANG, 21, Heath-street, Hampstead, London, N.W.3 (HAM. 5329/0504).

Austin. The New Show Models A.30, A.40, A.50, and A.90. Limited number of deliveries now available to proven essential users.—Demonstrations, brochures, easy terms, application forms, on request from H. A. SAUNDERS LTD., Austin House, 140–144, Golders Green-road, Golders Green, N.W.11.

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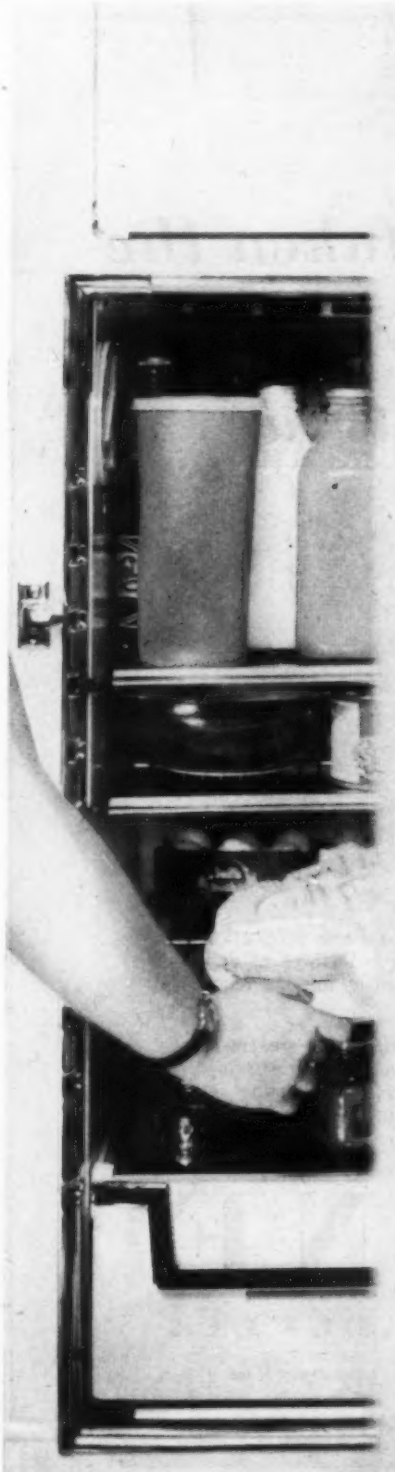

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MEDITATIONS ON THE SOURCES OF KNOWLEDGE *

Sir GEOFFREY JEFFERSON
C.B.E., M.S. Lond., F.R.S.

DURING the last five or six years we have come nearer than at any time in our history to obtaining a glimpse of the ground plan of the integration of the brain, of the way in which it works as a whole. For the spinal cord this point had been reached some few years ago, though within the life-times of many of us. Satisfying though this new orientation is, it has not yet reached a point when it sheds a bright new light on the differences in personal skills, in intellectual ability and imaginative thinking that are the hall-marks of individual differences between ourselves. Are men born equal and what are the springs from which genius flows?

One hundred years ago your speakers would have had no doubts of the perfectability of Man, and in the present case of this audience, nor would they have questioned his limitless powers of absorbing information. Numbers of intelligent, influential, and generous men and women were at that time tireless in their efforts to spread education amongst the working classes, in the hope, let us suppose, that the workers would think exactly the same way as their educational benefactors. Any wrong-headedness amongst the artisans was thought to be due to their ignorance. Today there are still many who hold fast to this old mythology. For myself as a teacher of many years standing my faith in these slogans is feeble. Wilfred Trotter in one of his luminous addresses remarked that although it is the boasted aim of teachers to make their students think for themselves, they are often surprised and even deeply hurt by the results of that admonition. I know, you all know, man's ability to absorb information and, what is more, to make use of it, but we also know that this ability is very unevenly distributed. Even more striking when you come to think of it is Man's enormous powers of rejecting information. For although our nervous systems have great ability to select, some are so selective or so unabsorbent that they reject almost everything. The odd thing is that some of them nevertheless get into our universities and hospitals as students, only to discover that the information offered is not suited to their particular genius. These thoughts led me to believe that it might be opportune to speculate for a few minutes on the sources of human knowledge, on differences in personal skills, and in imaginative thinking.

* * *

Each one of us takes the acquisition of his own personal store of knowledge so much for granted that a thought is rarely given to the ways in which it was acquired. It is perhaps trite to say that all our knowledge has been won, has been a personal acquisition, the result of our passage through life. We inherit nothing but instincts; we have no congenital ideas, no inborn knowledge, nothing but the machinery to acquire such things. It was Aristotle who remarked that there is nothing in the mind but what previously had made its way there through the senses. That at least came to be the accepted synopsis of Aristotle's passages on psychology though the phrase, according to Sir David Ross, the authority on Aristotelean texts, cannot be found in his works. Ancient though the statement is, we may still obtain some amusement from it, especially when we come to test its accuracy. Before we do question it we must admit its general truth—*Nihil est in intellectu quod non prius fuit in sensu.* To the average man and woman, the proposition that those precious possessions, their individual minds, are no more than receptacles comes as something of a shock. One's own intellectual processes, one's knowledge and beliefs, seem to be such personal and private possessions that it seems denigratory to attribute them to an accumulation of sensations of different kinds. So the idea that everything that goes on in our minds is nothing better than the sort of fermentation, the simmering or boiling of a colossal stew composed of the odds and ends of all that we ever saw, read, felt, smelt, heard, or touched from our cradles onwards to the present now—whenever that "now" is—I am sure that such a definition of what is in our heads would be repulsive to most people. I fancy, in fact, that there are few who would not feel insulted by Aristotle. "What," they might say, "what monster is this that says that this mind of mine is composed of nothing but the odds and ends of the past—much of it, in any case, best forgotten? Am I then no better than one of those stuffed toys which, no matter how delightful its exterior, is found to be packed with repulsive odds and incongruous ends? Surely, surely, these thoughts and ideas that I have are essentially my own inventions, the ingenuities of my own fertile and charming mind, and not the pickings from the dust heap of my past?" I sympathise deeply with such protestations, and agree that you are quite right. Individually you have done something strictly personal to your memories. But supposing that I grant you this I must ask you before you force poor Aristotle back under the soil from which he has made so unwelcome an eruption to consider one or two facts that are in the man's favour. Why is it, I must inquire, that whatever inventions we hit upon, whatever are the productions of our minds or hands, they are always of the kinds to which we have been trained or have trained ourselves? If our minds were capable of the pure inventions which our pride tells us is the case, why, sir or madam, do you not add to the sum of human knowledge by some flash of intuitive reasoning far outside your usual orbit, make some mathematical postulation, provide some explanation in atomic physics, some statement on molecular structure in physical chemistry, some new discovery in astrophysics or in biology, some superb musical composition or work of art such as would not only win the world's approval, not only gratify but certainly astonish your friends? You will have to confess that you yourself would be greatly surprised by such a creation. The reason is clear—that discovery is only to be made by those who have put into their heads the material necessary for discovery or have assiduously practised skills. And so we have, regretfully, to allow that there is something in Aristotle's annoying remark. A question however will certainly crop up here. The question is this: If all that our minds produce is no more than the choices we make of what has happened, how comes it that some people make more of their experiences than others? You will very rightly say something like this: "From your description of what you thought Aristotle meant, it should be that the only thing that mattered was richness of experience and variety in life. How then would you account for people like John Bunyan or Keats or de Quincey or the Brontës, or Dylan Thomas, people whose lives were not a blaze of colour? Information alone is surely not enough. Is there no talent, no genius inherent in the mind, dilute, unrecognisable in some, gloriously alive in the few? How in short do we make the choices that, in summation, build up our intellectual store? What are," you inquire again, "and where, the springs of genius?" The question has, as you know, or can readily imagine, been answered differently at different periods, theologically, metaphysically, and mechanically—to follow in that order. Evidently there are the greatest differences between individuals and lucky are we that it should be so, for uniformity breeds dullness. Jean

* Opening address of the session at University College Hospital Medical School, London, Oct. 4, 1955.

Jacques Rousseau may be permitted to break in at this point and repeat something that he said in his once famous *Discours sur l'origine de l'inégalité parmi les hommes* (1754). He held that the untutored unspoiled mind of the savage must necessarily have given him nobility, a gentle, good, and sweetly unselfish character. It had been, Rousseau held, the rapacity of those who acquired property who had spoiled him. But, it will be remarked, these evil people must necessarily have arisen from the same delightful people. Rousseau had to admit that the noble savage had probably never existed but held, like a true demagogue, that objections such as the foregoing were fit only for slaves. Having destroyed his thesis as soon as he postulated it Rousseau might have been expected to tear up his manuscript and try a different theme. But not a bit of it, he develops his theory based on false biology with sufficient conviction to make a deep impression on European thought in the mid-18th century, which was ready enough in its mood of questioning the correctness of traditional opinion as would so quickly appear in the *Liberté, égalité, fraternité* of the French Revolution. This idea was quickly adopted and early written into the American Declaration of Independence by men moved more by emotion than by common sense—that all men are born equal and have certain inalienable rights. In a withering attack on Rousseau's theories J. H. Huxley called the equality of men "probably the most astonishing falsity that ever was put forth by a political speculator; and that, as all students of political speculation will agree, is saying a good deal for it." Rousseau had admitted that the state of nature no longer existed, perhaps never existed, and probably never will exist. Huxley dryly commented "the amount of philosophy required to base an argument on such grounds may well be unattainable."

No man today will hold that all men are born equal in anything but impotence, whatever their political rights may be, though even there we would well guess that some men and some peoples would use them with greater wisdom than others. Suppose that we take that for granted, problems still arise—can inherent inequalities be erased by education, by training? I confess that when I was an undergraduate I thought that they could, believing that those who found difficulty in learning anatomy or grasping physiological ideas did so because they lacked diligence. How sadly was I mistaken. I confessed it early enough by saying during a medical students' debate, on what subject I have forgotten, that "You can lead an ass to knowledge but you cannot make him think." Slender though this witticism is, it does contain a truth. Universities, colleges, and schools certainly protect themselves so far as they can by extorting entrance tests. In parenthesis, the evidence that these tests are much harder than they were 10, 20, or 30 and more years ago is based on extremely suspect evidence—that of fathers and mothers who have difficulty with their children's homework or are unable to answer their examination papers. But mother has long ago lost one kind of knowledge whilst acquiring new and that is true of father also. You may interject: "You infer now that my mind is, as it were, a horse that needs exercise to prevent it becoming fat and lazy. Is that what you really suggest?" I reply: "Yes, indeed I do mean that—it is like not one but a whole string of horses (to continue your simile) each of whom requires constant work if it is to retain its qualities. Only too easily will these creatures lie down and forget." Whilst it would be unwise to omit mention of these mental frailties it would be more than foolish to give it all up as a bad job and say that no-one can teach anybody anything, that everything is learned, not taught. But that is not really so foolish, because it is largely true. Yet it is a fact that teaching does help the willing learner. Words are our difficulty, the right words for the right people, because the same vocabulary does not have the same meaning for everyone. We think that language, our own language, is polyvalent for every English man and woman but it is not so. A concept apparently clearly expressed has one meaning for one group, a different for others. Hence no doubt the fact that a committee or any group given what appear to be the facts clearly expressed will so often arrive at different conclusions and often end in violent disagreement and hostility. There is always a minority opinion. I know that differences in interpretations stem usually from the different personal histories of those who seek a truth, that emotions (which Aristotle left too much out of account) colour meanings, twist interpretations so that different conclusions ensue. Hence party politics and "party" everything. Probably the inherent pugnacity of man, which Huxley in his famous Romanes lecture thought to be the essential reason for his survival over the difficulties of his environment, has much to do with the creation of differences. That pugnacity is variably apportioned in individuals, but is present in most people, both male and female. Let us not forget that progress is by no means inevitable, that it has to be fought for and that energetically. If there seems to be a conveyor-belt carrying civilisation steadily onwards it is because the many profit from the efforts of the few who when their stories are known have had to struggle hard if not to fight for their inventions. Emotion, then, though a danger when uncontrolled is the real motivating power that can and does drive the intellect to excellencies.

* * *

A conclusion that seems to emerge very clearly from this discussion is that we should take care quantitatively and qualitatively what we feed into our minds. What happens to such of this input as is actually stored must be a strictly individual affair. In school and university the nature of the input is standardised but the individual can vary it, and certainly should, by extracurricular reading and inquiry. The great ones in human history cannot have had anything but conventional educations (I am thinking of men like Newton and Rutherford) yet the conclusions that they drew from what they had read or been taught were strictly unorthodox. And there, of course, we have it—unconventionality, nonconformity in thinking is the mark of genius. As long as you think along the straight lines your teachers draw for you nothing really new can possibly emerge. In saying that I do so provocatively knowing quite well that by design or by accident they will have indicated the point at which certainty disappears. It is for you, in your good time, to go on from there. Which of you will do it? Not all. Some will lack the insight, the curiosity, the passion to explore an idea or, having one, may fail to see how to verify it. It is the test of a good idea that it is eventually verifiable. Others again will be lacking in energy, in the power to pursue thinking with sufficient continuity, will lack what the Victorians so well called "diligence." It is a most valuable quality. It is here that so many fail because they are too easily distractable, too lazy, though everybody is that to some extent. These qualities are certainly inherited; some families either possess or lack them sufficiently to be remarkable as both the biographies of some most successful families and eugenic studies show. We need more information on this fascinating subject.

What I have said about the inequalities in the spread of mental qualities is equally true of hand and body skills at which the few so greatly outmatch the many. There seems to be a sort of "wisdom of the body" in a coördination of timing of eye and hand and foot in a different sense from Cannon's original meaning of the phrase, a perfection of balance and rhythm, of faultless movement that is as uneven in its distribution amongst

human beings as is wit or beauty of face and form. But let us not forget that we are in all things one with animals—racehorses, for instance, dogs, and perhaps performing fleas. Wherever we search we are sure to find those disparities. There are sure to be some dunces.

* * *

I have not yet answered the question with which I started—the why or how of the natural inequalities amongst men. Any answer must be purely conjectural because it is impossible to do anything better. Do brains differ from one another in the numbers of their cells? Almost certainly "yes." We do not know yet for certain because of the immense labour of counting the 10 thousand and more million that have been roughly computed. New methods—electronic—of scanning and counting them are now being devised so that an answer will come before many years have passed. One wonders further whether nerve-cells are standardised, whether some sorts are "better" than others, and by that I mean more perfect fragments of mechanism. We do not really understand the differences in their appearances as we see them through the microscope. Histochemistry is bringing us information on the composition of the cells of the brain which is basically a chemically operated machine in which the endocrines most variably play a part. It will not be so easy to attach a clear physiological or psychological meaning to what we learn this way. Do some kinds fatigue more easily than others? Is there, perhaps, a quantitative difference in the proportions of the different sorts of cells in the cortex and subcortical grey masses? Very likely there is. Which cells are the most important for a human being to have richly and in what areas should they be? If these possibilities should one day be proved to be true, will not these differences also be found in the "visceral brain," those parts more responsible for emotional swings and urges? I should think so. Given such differences there should be personal or familial variables in the internal workings of our nervous systems, variables in the speed of synaptic transmission, differences from man to man in the facilitations of his association pathways, differences also in inhibition. Something like this must be the foundation of the great differences in powers of memory which make anatomy, for instance, an easy subject for some, a torment for others. Physiology, which depends more on logical argument, should be easier for those with the better powers of association. There should be, too, in the variables of association the basis of the power to pounce upon an idea which my colleague, the mathematician Maxwell Newman, I think rightly takes as the real root of original speculation—of genius.

I have made no mention of mechanical minds, of machines that certainly act at times in ways recognisably like human mental processes. They are interesting and valuable counterfeits. It is conceivable that they may one day give us a clearer insight into how our nervous systems work than will direct anatomical and electrical studies of nervous constellations. I do not invoke their aid today, not because I believe that brains work in some supernatural way—far from it—but because so far they give us only the faintest glimpses of how to explain those differences in mental powers, in intelligence, character, and personality which I have been attempting to explore. I still believe that the only valid answers to the problems set by the human nervous system must be tediously and painstakingly wrung from the study by all means at any time available of man himself.

Meantime, and surely always, we must each of us learn to make the best of the apparatus which our genetic inheritance has given us and try to steer this potentially treacherous machine through life as best we may. The "how" of it lies far far ahead but one answer, and it might not be the complete one, should emerge along the lines of the speculations just indulged in.

COMBINED RADIOTHERAPY AND RESECTION FOR CARCINOMA OF THE BRONCHUS

EXPERIENCES WITH 66 PATIENTS

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IT is generally accepted that pulmonary resection offers the best possible hope of permanent cure of carcinoma of the bronchus. But surgery is applicable to only a small proportion of the apparently increasing number of patients with this disease. Smithers (1949) estimates that out of 8000 people suffering from carcinoma of the bronchus in 1945, only 150 were treated by surgery—i.e., about 2% of the total. Even though surgical facilities have improved in the last ten years, the number of patients who are suitable for a thoracotomy is still probably less than 15%. Besides this fact, that only a small proportion of patients with carcinoma of the bronchus are assessed as clinically operable and have a thoracotomy, between 20 and 25% of these are found to be inoperable when the chest is opened.

The five-year survival-rate of patients undergoing a resection has been quoted by Mason (1949) as 12½%, by De Bakey et al. (1952) as 19%, by Gibbon et al. (1953) as 22%, and by Thompson (1952) as 34%. The figures may continue to improve but it is still true that surgery can help only a small fraction of patients with cancer of the lung.

Radiotherapy is widely held to be an unsatisfactory method of achieving a permanent cure. The salvage of inoperable and advanced cases has been the relatively cheerless task of radiotherapists, who have had very little opportunity of treating the disease at an early stage. Irradiation has certainly been accepted as being of palliative value for certain distressing effects such as superior mediastinal obstruction, hæmoptysis, dyspnœa, dysphagia, or pain. It has been debated whether radiotherapy does actually prolong the life of the patient. To establish this point clearly by comparing a series of patients treated by irradiation with an untreated series would hardly be practicable. The survival-rates of patients treated by irradiation alone, as judged by figures from various departments, have not been encouraging, and among the long-term survivors the histological diagnosis has often been doubtful. Dobbie (1944) reports 2 five-year survivors out of 170 patients treated, Smithers (1951) 1 five-year survivor out of 285, Hilton (1955) 8 five-year survivors out of 203, Mason (1949) 2 five-year survivors out of 113, and Brown (1952) 2 five-year survivors out of 218. It should be noted, however, that the second figure quoted in each case refers to all patients treated and not to the possible number of five-year survivals. Although surgical results show an obvious balance in favour of resection, no comparison with radiotherapeutic results can in fact be made, since favourable cases are referred for surgery, and mostly "salvage" cases for radiotherapy. Treatment of carcinoma of the bronchus has also been attempted with a number of chemical substances—e.g., nitrogen mustard, urethane, œstrogens, H11, and others. Davidson (Davidson et al. 1951), summarising his experience of the use of chemotherapy in the treatment of lung cancer, concluded: "It would hardly appear that their use has been vindicated."

Combined Treatment

In view of this somewhat gloomy picture, it was felt that it would be valuable to give clinical trial to a method

combining radical radiotherapy with surgery in all suitable cases. A bronchus-tumour clinic was organised at Hammersmith Hospital, and this was attended by radiotherapists, chest physicians, and thoracic surgeons. Patients were referred to this clinic mainly by members of the staff of Hammersmith Hospital, St. Helier Hospital, St. Charles' Hospital, and Mayday Hospital. The clinic was held weekly. Each patient was assessed on clinical, radiological, and bronchoscopic grounds and placed in one of the following groups:

Group I: Operable.—To be treated by radical radiotherapy.

Group II: Technically operable only.—Considered inoperable because of poor general condition; resection thought to be contra-indicated by insufficient cardiopulmonary reserve or other physical defect. To be treated by radical radiotherapy.

Group III: Inoperable due to site.—Growth found to be bordering on the carina, or enlarged glands causing subcarinal deformity. To be treated by radical radiotherapy.

Group IV: Inoperable due to intrathoracic extent of the disease.—Gross mediastinal-gland involvement, chest wall involvement, or paralysis of the recurrent laryngeal nerve. To be treated by radical radiotherapy.

Group V: As group IV.—Patients unsuitable for radical radiotherapy because of poor general condition. To be treated by palliative radiotherapy.

Group VI: Inoperable due to distant metastases.—To be treated by palliative radiotherapy.

Group VII: Recurrence after operation.—A small group confined to patients who had had a resection prior to the start of the clinic. To be treated by palliative radiotherapy.

Group VIII: Patients unsuitable for any form of treatment.

When X-ray treatment was finished, a further bronchoscopy was performed. After a period of convalescence the patient was again seen at the clinic. At this attendance a further assessment was made and if the condition was considered operable on clinical, radiological, and bronchoscopic grounds, the patient was advised to come into hospital for a possible thoracotomy.

The clinic began on Nov. 1, 1949. Between this date and Oct. 31, 1953, 732 patients were seen and of these 573 were treated. This paper is concerned with those 66 patients (58 men and 8 women) who underwent resection. It is hoped that in a further paper the whole series will be analysed in detail.

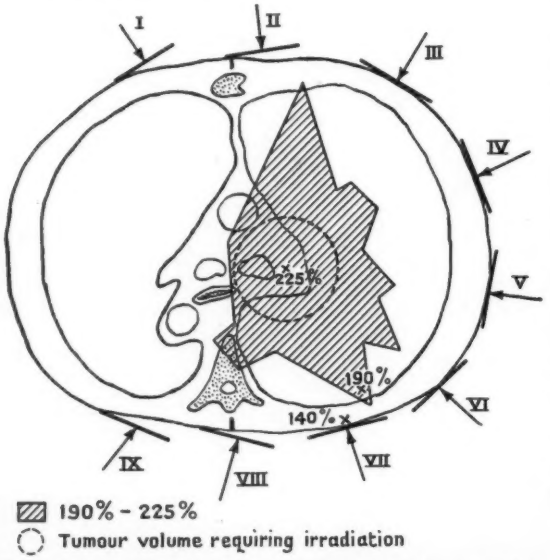

Fig. 1—Cross-section of the chest at the level of the tumour centre showing the distribution of X-ray dose. This represents a typical example of field-planning for a carcinoma situated in the region of the right main bronchus.

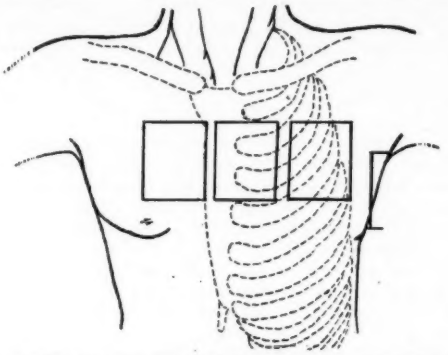

Fig. 2—Typical 8×6 cm. fields for a patient with a carcinoma in the region of the left main bronchus. Anterior and axillary fields are shown. There are also four posterior fields.

The patients who ultimately had a resection were drawn from groups I, II, and III. The inclusion of patients from group I is self-explanatory. The inclusion of some from group II was possible because of the occasional remarkable improvement in general condition following radiotherapy. The inclusion of patients from group III was possible when there was bronchoscopic evidence of marked regression of the tumour and its disappearance, naked-eye and in biopsy specimens, from the region of the carina or trachea, and a normal subcarinal region. No patients in any of the other groups were operated on.

The average time between the first attendance at the clinic and the start of radiotherapy was nineteen days, and between the completion of irradiation and operation seventy-four days (this includes twenty-eight days away for convalescence). The average time between first attendance at the clinic and operation was nineteen weeks. This long period was extremely disturbing to all concerned and is to a great extent a reflection on the shortage of available beds both for radiotherapy and for surgery.

Radiotherapy

Radiotherapy was given with the apparatus then available—i.e., varying between 190 and 250 kV. The half-value layer in all cases was 2 mm. of copper. The area to be treated was decided on the basis of the clinical, bronchoscopic, and radiological findings. The programme of treatment for each patient was carefully planned and the tumour and skin doses were estimated individually (fig. 1).

Treatment was based on multiple small fields using careful beam direction. A coplanar field arrangement was employed (fig. 2). The treatment set-up was checked in most cases by screening or X rays. The number of fields varied from 5 to 10; field sizes were 6×8, 5×10, or 8×10 cm. The dose aimed at was 5000 to 5500r in five to six weeks but whether this could be achieved with the apparatus available often depended on the antero-posterior diameter of the chest. In practice the tumour dose varied between 3700 and 6000r, the average in the 66 patients being 4700r. The time taken to complete the course of treatment varied between thirty-two and fifty days, the average being about six weeks.

Because of the frequency of pulmonary sepsis in association with the tumour, usually in the lung distal to the carcinoma, and the likelihood of a flare-up of this sepsis when irradiation was started, antibiotics were freely used, especially in the first few weeks of treatment.

The treatment was pushed in these "radical" cases to the limit of skin tolerance and was stopped at the stage of beginning moist desquamation or severe erythema. These skin reactions responded satisfactorily and quickly to the usual measures. Dysphagia due to an irradiation

œsophagitis was generally not severe enough to necessitate stopping treatment. Its height was reached usually after the completion of treatment and was never sufficiently severe to affect the nutritional state of the patient. Field-planning paid no regard to that area of skin likely to be within the region of the future thoracotomy incision.

Surgery

Thoracotomy was carried out under general anæsthesia given through an endotracheal tube. The pleural cavity was entered usually through the bed of the resected 6th rib. No particular technical difficulties were encountered although in some cases it was the surgeon's impression that the hilar structures were surrounded by more adherent fibrous tissue than usual. This made dissection of the vessels sometimes difficult but not unusually formidable. There was no excessive bleeding either from the skin or muscle layers. The tissues held stitches well and healing of the chest wall was normal except in one instance where resuturing was necessary (the particular patient concerned also developed an early bronchopleural fistula).

TABLE I—SIDE AND SITE OF THE CARCINOMA IN 66 RESECTED CASES

—	Total	Main bronchus	Upper lobe	Middle lobe	Lower lobe
Right ..	39	7	13	1	18
Left ..	27	7	6	..	14

The vessels of the hilum were individually ligated with thread and the bronchus closed with stainless-steel wire sutures in most cases, but in a few thread was used. No formal procedure was adopted in this series for giving added cover to the stump of the bronchus. Routine dissection and removal of mediastinal glands was performed. The operation was pneumonectomy in 64 patients and lobectomy in 2. Of the patients undergoing resection, 52 originated in group I, 3 in group II, and 11 in group III.

Pathology

Histological proof of carcinoma was obtained in all cases. In the overwhelming majority the diagnosis was established by a biopsy taken at the first bronchoscopy. It will be realised from this that most patients had carcinomas which can be termed "main bronchus" types rather than "peripheral" tumours although a few examples of the latter are included in the series. Dr. Bernard Lennox, of the department of pathology at Hammersmith Hospital, examined and reported on the lung specimens of which there were 62; 4 were unfortunately lost. In these 4 histological diagnosis had already been made at the original bronchoscopy.

TABLE II—HISTOLOGY OF THE GROWTHS IN 66 CASES, SHOWING THE RELATIVE INCIDENCE IN THE VARIOUS PRETREATMENT ASSESSMENT GROUPS

—	Total	Group I	Group II	Group III
Squamous ..	42	35	1	6
Oat	11	9	1	1
Adenocarcinoma	3	3	..	..
Others	10	5	1	4

The side and site of the neoplasms are shown in table I.

Table II shows the histological classification in the 66 patients. Besides the three main types which are well defined (squamous, oat-cell, and adenocarcinoma), there were 10 cases which did not clearly fall into one of these categories. These included some described as "mixed adeno and squamous carcinoma," "anaplastic carcinoma," or "carcinoma simplex"; the majority of these were probably of squamous origin. They appear in the table as "others." This table shows that the relative incidence of the main types is similar to that found in an unselected series of carcinoma of the bronchus. It will also be observed that no significant difference in histological distribution is found when the cases are analysed according to the pretreatment assessment groups I, II, and III.

TABLE III—LUNG SPECIMENS: MACROSCOPIC AND MICROSCOPIC CLASSIFICATION BASED ON EFFECTS OF PREOPERATIVE IRRADIATION ON TUMOUR

—	Total	Group I	Group II	Group III
No tumour present..	29 (*46·7%*)	24	..	5
Tumour present but degenerate ..	14 (*22·5%*)	11	1	2
Tumour present and viable	19 (*30·8%*)	14	1	4
Specimen lost ..	4	..	..	..

Table III shows the findings in 62 of the lung specimens received by Dr. Lennox, classified according to the effects of irradiation on the tumour. It will be seen that no tumour could be found either in the lung or in the glands in 29 cases (46·7%). In all lungs many blocks were taken but when no tumour was found special efforts were made to confirm this finding, further blocks being taken and examined. The ultimate fate of this group of patients who apparently had the primary tumour eradicated by radiotherapy is shown in tables VIII and IX.

TABLE IV—SUMMARY OF RESULTS

Total	Operative mortality	Died with cancer present	Died from intercurrent disease	Alive with cancer	Alive without cancer
66	10	38	5	2	11

In 19 specimens (30·8%) viable tumour cells were clearly present although the histological report often commented on the considerable regression of the growth that had taken place.

The category "tumour present but degenerate" includes those cases which histologically showed overwhelming degeneration of the tumour but cells were found which may have been viable. There were 14 such specimens (22·5%).

Results

The majority of the patients who died did so at home, and necropsies were performed on a limited number only. Where one was not performed the patient was considered, for the statistical analysis, to have died with cancer present, irrespective of the clinical findings at the last examination. The grouping "intercurrent disease" refers only to those patients on whom a necropsy was in fact done, and in whom cancer could not be found. Table IV gives an over-all summary of the results; these obviously require more detailed analysis. The results are given as found on May 31, 1955. Thus, the survival-time of patients lies somewhere between nineteen months and five years seven months.

TABLE V—PATIENT'S SURVIVAL-TIME

Survivors	5 yr. and over	4 yr.	3 yr.	2 yr.	Over 18 mos.
No. possible	11	21	20	12	2
No. actual..	2	3	5	3	..

Table V shows the actual survival-time in years of the patients at present alive, and compares this with the number who could have survived this particular period.

Table VI shows the duration of survival of the patients now dead. It excludes 10 who died during the postoperative period in hospital (the latter are discussed separately below). This table may be of value in assessing the possible prolongation of life by the particular method of treatment used. It should again be pointed out that the grouping " cancer present " is used because the majority died at home and no necropsy was possible.

Table VII analyses the results according to the histological type of tumour and it will be seen from this that the majority of survivors come from the group of squamous carcinomas; this conforms with general surgical experience.

TABLE VI—SURVIVAL-TIMES OF 43 PATIENTS

(Excluded from this table are 13 patients still alive and 10 patients who died postoperatively)

—	No. of patients	Survival-time				
		Under 1 yr.	1–2 yr.	2–3 yr.	3–4 yr.	Over 4 yr.
Cancer present ..	38	21	11	4	..	2
Intercurrent disease	5	2	1	1	1	..

Tables VIII and IX give the results according to the pathological examination of the removed specimens (compare table III).

It is interesting that 7 of the 13 patients still alive come from the " no tumour present " group and that 12 of the 13 survivors come from group I. Of the 14 patients originally assessed as inoperable and who, after radiotherapy, had radical surgery, only 1 is alive (three and a half years after beginning treatment and at the last attendance showing signs of recurrence). In 4 patients, however, necropsy showed no evidence of malignancy, and 1 of these lived nearly four years.

Mortality and Morbidity

The immediate operative mortality in the 66 patients was 3, 1 dying from hæmorrhage, 1 from a coronary thrombosis, and 1 from cardiorespiratory failure. All these deaths occurred within twenty-four hours of operation. 7 patients died during the postoperative period in hospital—5 from an early developing bronchopleural fistula, 1 from a pulmonary embolus, and 1 from secondary hæmorrhage from a pulmonary vein.

TABLE VII—RESULTS ACCORDING TO HISTOLOGY

Type	No. of patients	Alive	Alive with recurrence	Died post-operatively	Died (intercurrent disease)	Died (cancer present)
Squamous ..	42	9	1	6	4	22
Oat	11	..	..	3	1	7
Adenocarcinoma ..	3	..	1	..	..	2
Others ..	10	2	..	1	..	7

Empyema

There were 5 patients who developed an empyema not associated with a fistula. All these were diagnosed later than one month after operation, the earliest being five weeks and the latest six months. All patients had left hospital and had to be readmitted for further surgery. Of these patients, 1 still survives five years after a pneumonectomy, having had his empyema treated by a lateral thoracoplasty; 1 died four years after resection without evidence of malignant disease at necropsy; and the remainder died shortly after developing the empyema.

TABLE VIII—RESULTS ANALYSED ON THE BASIS OF THE PATHOLOGICAL FINDINGS IN REMOVED SPECIMENS (GROUP I)

Pathological findings	No. of patients	Alive	Alive with recurrence	Died post-operatively	Died (intercurrent disease)	Died (cancer present)
No tumour present	24	6	1	4	3	10
Tumour present but degenerate ..	11	2	..	1	..	8
Tumour present and viable	14	2	..	2	..	10
Specimen lost ..	3	1	..	1	..	1

Bronchopleural Fistula

Infection of the pleural space inevitably accompanied all cases of bronchopleural fistula. There were 13 patients who developed fistulæ. Of these 9 were considered to be early—i.e., they were diagnosed prior to their discharge from hospital, whilst 3 developed the condition within three months of operation, but following discharge from hospital, and 1 eight months after operation. This gives a total complication rate of empyemas, and fistula with empyema combined, of 18 patients out of the 66 who had a resection. This is 27% of the total, undoubtedly a high figure and one far in excess of that normally encountered. It is nowadays a comparatively rare complication of a resection for carcinoma. In our series fistula was a fatal complication in all cases except 1.

TABLE IX—RESULTS ANALYSED ON THE BASIS OF THE PATHOLOGICAL FINDINGS IN REMOVED SPECIMENS (GROUPS II AND III)

Pathological findings	No. of patients	Alive	Alive with recurrence	Died post-operatively	Died (intercurrent disease)	Died (cancer present)
No tumour present	5	..	..	1	..	4
Tumour present but degenerate ..	3	..	..	..	1	2
Tumour present and viable	5	..	1	..	1	3
Specimen lost ..	1	..	..	1	..	..

We have further analysed in detail these 18 patients who developed empyema and bronchopleural fistula and found no correlation with age, sex, or histology. The complications were more common on the right side (14 on the right, 4 on the left). With regard to tumour dose, it was found that the average given to this group of 18 was 4780r as compared with the over-all average of 4700r. It was found, however, that a proportionally greater number of these 18 received 5000r or over than was the case in the remainder of the series.

Of the 11 patients in group III who, when first seen, had tumour present at the future line of section of the bronchus, 3 developed these complications. This does not appear to be significantly different from the over-all incidence of empyema and fistula in the series.

Discussion

Even a superficial study of the figures presented in the tables reveals that there can be no claim that this form of combined treatment has produced impressive results. There are several drawbacks to the method.

Firstly, the treatment takes a long time to complete. Even if we eliminate all waiting time before admission and initial treatment, the over-all time between the patient first being seen and the resection being performed would be about seventy-eight days. This is made up of about forty-two days for irradiation and investigations

before and after it, twenty-eight days for convalescence, and eight days for pre-resection preparation. This is undoubtedly trying for the patient, particularly when admission delays are added to the total time taken to complete treatment. This is especially serious because the average survival-time of a patient with an untreated carcinoma of the bronchus is known to be short, and has been variously estimated to be between four and nine and a half months from the time of diagnosis. Further, it cannot be excluded, although difficult to prove, that patients develop metastases during the period of treatment. Certainly in our experience of some other patients treated at this hospital, metastases did become apparent whilst undergoing radiotherapy, or during convalescence following it.

Secondly, the high incidence of empyema and fistula in this series appears to be associated with the method of treatment adopted, and must be viewed very seriously. Pathological examination of the specimens failed to reveal any visible lesion to account for inadequate healing of the bronchus stump. There was no frank endarteritis of the vessels of the bronchial wall seen in blocks taken from near the line of section, neither was there any definite tissue damage although fine changes might not have been observed. These empyemas and fistulæ were not more common in the early cases of the series nor indeed at any particular time. The incidence was spread fairly evenly over the years covered by this report. Our impression was that most of the 18 patients with these complications were in a poorer general condition than other patients of the series, although this point is, of course, difficult to establish.

There are certain features of interest. Tumour had apparently been eradicated from the chest in nearly half the cases, thus tending to establish that irradiation can "sterilise" a significant proportion of operable lung cancers. Nevertheless in the patients under discussion the total results obtained did not show an over-all improvement.

Unlike some observers we have not found that patients are unduly upset by planned and carefully fractionated radiotherapy using small fields. On the contrary we have found that the constitutional effects were slight and we have often been impressed by the considerable improvement in the general condition of the patient.

14 patients who were originally assessed as inoperable became operable and had a pneumonectomy performed after irradiation. Although the results in these patients (groups II and III) are unsatisfactory, the numbers involved are too few for any definite judgment to be made. Whatever assessment is reached of the method as a whole, it seems to us that a case might well be made for treating a selected group to a high dosage in the hope of making them operable.

When this inquiry began we hoped for better results than we can now present. Nevertheless we feel that a great deal has been learnt from this experience of combined therapy. New methods of irradiation with more powerful apparatus now available, as well as improvements and variations in surgical technique, may influence the future approach to the problem of carcinoma of the bronchus.

Summary

A method of assessment was devised for patients with carcinoma of the bronchus attending a joint clinic. Of 732 patients who attended the clinic, 66 were given a course of radiotherapy which was followed by resection of the lung. Details are given of the method of irradiation employed and the type of surgery carried out. The assessment of the results included an analysis according to the pathological findings and the histological changes after irradiation. The tumour had apparently been eradicated from the chest in nearly half the cases, but there was a high incidence of empyema and fistula. It is not considered that the method of treatment has produced impressive results, but several interesting features have emerged from this inquiry.

We should like to express our great indebtedness to Dr. Constance Wood and Mr. W. P. Cleland under whose direction and guidance the work has been carried out. We should also like to acknowledge the contributions of our many colleagues in the departments of medicine, surgery, radiotherapy, and physics who have participated at various times in the investigations undertaken by the clinic at Hammersmith Hospital.

REFERENCES

Brown, D. E. M. (1952) *Brit. J. Radiol.* **25**, 472.
Davidson, M., Smithers, D. W., Tubbs, O. S. (1951) The Diagnosis and Treatment of Intrathoracic New Growths. London; p. 126.
De Bakey, M. E., Ochsner, A., De Camp, P. T. (1952) *Surgery*, **32**, 877.
Dobbie, J. L. (1944) *Brit. J. Radiol.* **17**, 107.
Gibbon, J. H., Allbritten, F. F., Templeton, J. Y., Nealon, T. F. (1953) *Ann. Surg.* **138**, 489.
Hilton, G. (1955) *In* British Practice of Radiotherapy. London; p. 271.
Mason, G. A. (1949) *Lancet*, ii, 587.
Smithers, D. W. (1949) *Ann. R. Coll. Surg. Engl.* **4**, 242.
— (1951) *In* Davidson et al. (1951); p. 186.
Thompson, V. C. (1952) *In* Diseases of the Chest. London; vol. 2, p. 329.

PNEUMONIA AND INTERSTITIAL INFLAMMATION OF THE LUNG

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In recent reports the terms interstitial, virus, or atypical pneumonia have been commonly used (see Golden 1944, Dingle 1947, Reimann 1947). Some workers have designated very slight changes in the lung as interstitial pneumonia or pneumonitis, with the implication that something of importance has been recognised. It has seemed useful to study pneumonia, especially in children where it is, perhaps, least likely to be complicated by other chronic respiratory or circulatory diseases, and to assess the importance of inflammatory changes in the interstitial tissue of the lung.

Material

This study is based primarily on an analysis of 800 unselected necropsies of children, aged 1 month to 15 years, who died in the hospitals for children, or in the infectious-diseases hospital, in this city between 1938 and 1952. These cases were collected in the department of pathology, Queen's University.

Pneumonia in the neonatal period present special problems, since œdema fluid then collects very readily in the lung and facilitates wide dissemination of infection through the air-spaces and lymphatic pathways, and immature reflexes often allow the aspiration of infected material from the air-passages. Accordingly no neonatal cases are included.

In all cases each organ was examined histologically. Usually about twenty sections, including two or more lung sections and often also sections of trachea and of larynx, were on file for study. These cases are probably not representative of all deaths in infancy, but they are from the general pædiatric practice of hospitals and are not cases referred to a highly specialised research centre.

The primary causes of death are listed in table I. Half the cases were due to acute infection, and almost 10% of all deaths were due primarily to pneumonia. In roughly another 10% pneumonia was present as a complicating factor, but as far as can be assessed it was not the factor primarily responsible for death. In children under 1 year all types of pneumonia were about twice as frequent relative to other causes of death as in later years.

Classification and Incidence of Different Types of Pneumonia

It is most desirable to distinguish pneumonia as a complication of other diseases from pneumonia as a primary disease of the respiratory tract. The lungs are influenced by changes in the cardiovascular system, especially those leading to circulatory stasis in the lungs, and by infections elsewhere in the body. The integrity of reflexes and the efficiency of other protective mechanisms guarding the airways are influenced by the nervous system and disturbed by vomiting and by such conditions as infantile diarrhœa. Pneumonia, complicating these and other disturbances, may not be distinguishable from primary pneumonia by study of the lungs alone. The sequence and relative importance of the different disease processes is often difficult to determine, but nevertheless a distinction may usefully be attempted.

In bronchopneumonia the infection apparently spreads by the lumen of the small air-passages to the air-spaces. The walls of these air-passages take part in the reaction at the same time and in the same degree as do the air-spaces. The severity of the reaction may differ greatly between closely adjacent areas of lung. In contrast inflammation spreading uniformly, and apparently almost at the same time, throughout the air-spaces of all or the great part of one or more lobes can be described as lobar pneumonia, but this is extremely rare in infancy and childhood. Aspiration of gastric contents or other foreign material into the air-spaces provokes an inflammatory reaction, but in all the cases reviewed this occurred only as a complication of pre-existing disease elsewhere. Pneumonia in fibrocystic disease of the pancreas (mucoviscidosis) and in bronchiectasis is not a primary infection, but the chronic changes in the walls of the bronchi are of considerable interest for the present problem. Terminally in many diseases the air-spaces become filled with œdema fluid, and when a complicating acute infection occurs in these it may be difficult to distinguish the resultant hypostatic pneumonia from bronchopneumonia. In bronchopneumonia œdema fluid, formed as a result of the infection, may also collect in excessive amounts, especially in children. In the pneumonias complicating other conditions (tables II–IV) this distinction has not been made.

In some cases in the present study there was inflammation in the interstitial tissue of the walls of the air-passages, which had spread out into the interstitial tissue and the air-spaces around the smaller passages. When there was no disease elsewhere to cause death, this was almost always complicated by varying degrees of acute inflammatory exudation into the air-spaces. Whether or not it is so complicated, such an inflammation, affecting the walls of the air-passages and adjacent lung tissue, is here termed acute interstitial bronchopneumonia. Some prefer to call it an acute interstitial pneumonia. When severe, and especially when unobscured by a heavy acute inflammatory reaction in the air-spaces, this condition can be readily recognised. When slight and when complicated by a heavy secondary infection, it can very easily be overlooked by the pathologist. The prevalence of these various types of pneumonia in the 157 cases found in the 800 necropsies in the series is shown in table II.

TABLE I—800 NECROPSIES OF INFANTS AGED 1 MONTH TO 15 YEARS: PRIMARY CAUSES OF DEATH

Primary cause of death	Proportion (%) of total
Congenital	13
Trauma	7
Infection:	
Pneumonia	9
Various	37
Syphilis	1
Tuberculosis	9
Tumours	6
Miscellaneous	11
Uncertain	7

TABLE II—PNEUMONIA IN 800 NECROPSIES

Type	Primary	Complicating	Total
Interstitial bronchopneumonia	49 (69%*)	14 (16%*)	63 (40%*)
Bronchopneumonia	21	50	71
Lobar	1	..	1
Aspiration	..	7	7
With mucoviscidosis	..	9	9
With bronchiectasis	..	6	6
Total	71 (9%†)	86 (11%†)	157 (20%†)

* Percentage of all pneumonias.
† Percentage of all necropsies.

TABLE III—TYPES OF PNEUMONIA IN 800 NECROPSIES

—	Acute alveolar reaction	Primary: Acute onset	Primary: Insidious onset	Complicating
Interstitial bronchopneumonia:				
Mild reaction	Absent	3	4	..
	Slight	1	6	1
	Extensive	2	12	5
		6	22	
Severe reaction	Absent	2	1	2
	Slight	1	7	2
	Extensive	2	8	4
		5	16	—
		11	38	14
Bronchopneumonia		11	10	50

Interstitial Bronchopneumonia

The histological picture of interstitial bronchopneumonia has been described under various names, such as virus pneumonia, virus pneumonitis, atypical pneumonia, and interstitial bronchopneumonia of measles and whooping-cough; and it is part of the picture in inclusion-body pneumonitis and giant-cell pneumonitis.

TABLE IV—DISTRIBUTION OF TYPES OF PNEUMONIA BY PERIODS

—	1935–46	1947–52
Total necropsies	384	416
Type of pneumonia:		
Interstitial bronchopneumonia:		
Acute	6	5
Insidious	18	20
Complicating	2	12
Bronchopneumonia:		
Acute	5	6
Insidious	4	6
Complicating	25	25

The body has only a limited number of ways in which it can react to stimuli, and this reaction is not specific to any one agent or to any one group of agents. Measles and whooping-cough are probably among the most important single agents responsible; but other respiratory-tract viruses, febrile catarrhs, and influenzal-like and ornithosis-like viruses are important. It has been recognised for many years, and MacCallum (1919) gave an excellent morphological account.

Both the gross and the histological features are greatly modified by the severity and type of the associated bacterial inflammation. In some degree such inflammation was present in most of the present cases in which a lung infection was the only cause of death. In cases where there is little or no secondary infection the gross appearances of the lungs may escape comment, but usually there are numerous small areas of collapse and there is patchy congestion and some œdema. Congestion of the

bronchial mucosa is commonly noted, and more distinct changes, such as œdema and membrane formation, may be found, usually in those cases of acute laryngo-tracheobronchitis in which the patient has survived for a few days and interstitial bronchopneumonia is present.

Histologically the most distinctive changes are in relation to the walls of bronchi and bronchioles. Changes in the epithelial cells of the air-passages may be present, but are usually absent or unrecognisable. Descriptions of special forms where there are giant-cells (Pinkerton et al. 1945, Wolman et al. 1952) or cells with intranuclear (Goodpasture et al. 1939) or intracytoplasmic (Adams et al. 1942) inclusion-bodies tend to obscure the fact that these are only occasionally present. In fresh and well-fixed material, and in bronchi normally lined by ciliated epithelium, groups of cells may be cuboidal or flattened with loss of cilia. Mononuclear cells, chiefly plasma-cells and cells resembling them, predominate in a distinctive infiltration of the subepithelial tissues, and this results in thickening and increased prominence of bronchial and bronchiolar structures of all sizes. The severity of this reaction varies widely from area to area. In both larynx and trachea there is almost invariably some infiltration by plasma-cells, but the severity of this does not correlate well with the reaction in the lung, and it can occur without recognisable evidence of interstitial bronchopneumonia.

The changes in the terminal portions of the respiratory system are less distinctive. The walls of the air-spaces especially those bordering on the small air-passages, often appear thickened. Mononuclear cells resembling epithelial cells may appear to line these air-spaces and the walls themselves may seem unduly cellular. Generally also these air-spaces are filled with protein-containing œdema fluid and are collapsed. An objective assessment of changes in the walls of the air-spaces elsewhere is difficult. The reaction may, indeed, sometimes spread out and involve the partition walls between many of the small air-spaces, and often this may be best recognised in the slight condensations of loose connective tissue around small venules. Occasionally this may even appear more significant than the reaction around the bronchi. However, if the air spaces become, and remain, filled with œdema fluid the reaction must in time—often perhaps a week or more rather than a few days—become diffuse and thus resemble inflammation in œdematous mesenchyme elsewhere. In general, and until this happens, the reaction predominantly affects the peribronchial, peribronchiolar, and perivenular tissue—that is, those parts of the lung through which the lymph-channels pass and which are thus most exposed to the stimulus of foreign antigens absorbed from the respiratory surfaces. Again, many of the ætiological agents are probably viruses which attack the epithelium of the air-passages and do not produce a reaction in the ultimate air-spaces as do pyogenic bacteria.

The frequently superimposed acute bacterial inflammation may cause confusion. An adequate number of sections should be available for study because both the interstitial reaction and the acute exudate into the air-spaces may vary greatly from area to area of the lung. When there is no interstitial bronchopneumonia any reaction present is predominantly in the air-spaces and polymorphs are numerous. Even in an unresolved pneumonia mononuclear cells of the plasma-cell type are fewer than in interstitial bronchopneumonia, and their distribution is not comparable. Occasionally areas bordering on small abscesses, often those of a staphylococcal pneumonia, may cause difficulty. A chronic, low-grade bacterial infection of the bronchi and bronchioles, such as that apparently due to the abnormal mucus in mucoviscidosis (fibrocystic disease of the pancreas), may prove fatal, especially when the infection spreads to the air-spaces. It provokes a cellular reaction in the walls of the air-passages very similar to that of interstitial bronchopneumonia. Indeed, the numerous plasma-cells present are probably reacting to the same cause—that is, to the continuing presence of a foreign antigen.

Inflammatory changes in the interstitial tissue around bronchi and bronchioles as described were revealed at post-mortem examination in two-thirds of all the infections of the lung responsible for death (table II). In contrast they were found in only one-sixth of the cases where a lung infection complicated some other disease process.

Clinical Features and Cause of Death

Most cases in which death is primarily due to an interstitial bronchopneumonia fall into one of two groups. First, there are those in which death occurs after a brief illness of under forty-eight hours and more often of less than twenty-four hours, usually with no localising signs or symptoms. Careful questioning may reveal some symptoms of upper-respiratory infection, and sometimes there has been diarrhœa or vomiting. Often these cases are of medicolegal concern. In the other group the illness has an indefinite and insidious onset and is of some duration and may even have been present for a month or more. Only in about one-third of these cases is there a history of measles or whooping-cough. Symptoms are often non-specific. They may include gastro-intestinal disturbances, and those of respiratory origin include troublesome cough and distressed breathing. Physical signs in the chest, such as poor air entry and faint tubular breathing, are usually slight. Radiographically there may be an increase in the density of the hilar shadow. As complicating non-specific alveolar inflammation develops, clinical features may be modified and may become more evident.

In both groups the acute non-specific inflammation in the air-spaces is of great importance. Every degree of this will be found. It is rarely entirely absent, but in some cases it may be found only with difficulty. In the majority it is easily detected at least in some of the areas sectioned. Some attempt to group cases under these three grades has been made in table III. The results are of little significance. Acute cases of short duration tend more often than cases of insidious onset to have little or no acute polymorph reaction as evidence of superimposed bacterial infection. Though polymorphs are absent there is often fluid of high protein content in the air-spaces and focal congestion and hæmorrhage in the walls of the spaces. In the lung, moreover, perhaps even more than anywhere else in the body, the extent of cellular response is little or no measure of the severity or significance of a bacterial infection. When the epithelium of the bronchial tree, and the other defence mechanisms which guard the air-spaces, are damaged by interstitial bronchopneumonia it is possible that organisms of high virulence may sometimes gain access to the air-spaces in such numbers that an overwhelming infection occurs and invades the blood-stream without local cellular reaction in the lung. Post-mortem cultures of the lung have proved of little value as evidence for or against bacterial infection during life.

Death almost certainly occurs in only a very small proportion of cases; and, since it is very often determined by the presence and nature of the superimposed bacterial infection, it is scarcely to be expected that there will be much correlation with epidemics of virus disease of the respiratory tract. In the material reviewed there was no grouping of cases in the periods of influenza epidemics, and the relatively uniform distribution of cases throughout the year probably also indicates that a wide variety of organisms are responsible. Comparing the incidence before 1946 with that after 1946 when the newer antibiotics were introduced, it would appear that

these antibiotics have had little influence on the incidence of fatal cases or on the development of acute alveolar exudation (table IV). In the more acute cases antibiotics were often not administered, and in the more chronic cases scanty or fluctuating symptoms sometimes resulted in intermittent treatment terminated before death.

Reaction in Interstitial Tissue

The ultimate air-spaces of the lung may or may not be lined by a greatly flattened epithelium which, if present, may form a continuous or discontinuous layer. Recent evidence again favours the existence of such a layer (Low 1953), but whether it is present or not it encloses no real space in the partition wall of the air-spaces. In the aerated lung the few connective-tissue elements holding the blood-capillary networks together can contain few mononuclear inflammatory cells. As œdema fluid collects in the air-spaces and as these collapse mononuclear cells may increase in the walls and escape into the lumina of the air-spaces. Because the walls of the air-spaces are then no longer stretched, and perhaps often because mononuclear cells are migrating through them into the air-spaces, they appear thicker and more cellular than normal, and this probably depends to some degree on the duration of the collapse and œdema. Assessment of this change can only be a subjective impression. Such œdema arises from many different causes; and commonly low-grade infection and reaction to aspirated material modifies the histological picture.

It is misleading to recognise as an entity a non-specific change limited to the air-spaces and unassociated with distinctive infiltration of the walls of the air-passages. The title interstitial pneumonia or interstitial pneumonitis, frequently applied to this change, tends to imply such recognition, and, by failing to separate cases of secondary œdema and alveolar collapse from cases where there is some evidence of infection, it must confuse the issue. Especially in some reports (Menten and McClosky 1951, Gruenwald and Jacobi 1951) changes of this nature have been recognised in such a very high proportion of all necropsies that doubt must arise as to the correctness and value of the assessment.

In some cases the air-space partitions themselves are grossly thickened and cellular, and the intervening spaces are collapsed and lined in part or in whole by cells which are either swollen alveolar lining cells or downgrowths of the bronchiolar epithelium. Many of the cells in the thickened partitions resemble plasma-cells, and these cases may appear to differ from those described here since the reaction is not predominantly in the tissue around the air-passages and blood-vessels. In 3 cases reviewed these features predominated, but other cases showed transitions and the condition is probably not a distinct entity. Clear examples resemble the plasma-cell pneumonia of Continental workers; and, while the protozoan parasite (see Baar 1955) recognised in some cases of that condition was absent in all material examined, it seems probable that that condition also is not a specific reaction to a simple agent.

The histological picture in all pulmonary interstitial reactions suggests a basic type of response to some common stimulus. When a microbic organism enters the body it may be rapidly destroyed in the inflammatory reaction it provokes, or it may survive for a time especially when it grows within the cells of the host as does a virus. When it survives and multiplies it is a continuing source of antigenic material. The trend of recent studies suggests that plasma-cells, and cells resembling them, are concerned with reaction to antigens and with antibody formation. While lymphoid tissue may be the chief site of antibody formation, the reacting cells may appear in any condensation of incompletely differentiated mesenchyme close to the site of antigen stimulation. In the lungs the reaction could be provoked in the mesenchyme, especially that around bronchi and vascular spaces, by a wide variety of agents, including viruses invading the bronchial epithelium. Bacteria, if not destroyed by a prompt polymorph reaction, may survive in œdematous lung tissue and serve as an antigenic stimulus. In seriously ill children repeated aspiration of small amounts of food may provoke some reaction, but lipoid is a poor antigen and produces a different type of reaction. Some toxins circulating in the blood can probably stimulate the mononuclear cells of the interstitial tissue of the lung. Beryllium forms a compound with body-proteins which is antigenic (De Nardi et al. 1953), and, probably for this reason, when inhaled as fumes or fine dust it provokes a reaction with considerable thickening of the air-space walls which in its early stages is somewhat comparable to that under discussion. Such general factors as collapse, œdema, and vascular stasis influence the distribution of any antigen and also the ability of the different parts of the respiratory tree to respond. Endless minor variations can be recognised; but study of any large series of cases, or review of the extensive literature, must suggest that the histological changes are essentially non-specific and can give little or no indication of the exciting cause in any particular case.

Summary

Non-specific inflammation of the lung has been studied in a series of 800 necropsies on children aged 1 month to 15 years.

Pneumonia was the primary cause of death in 9%. In two-thirds this was an interstitial bronchopneumonia; but in at least three-quarters of these there was a distinctive inflammatory reaction in the air-spaces due to superimposed acute bacterial infection. The occurrence and nature of the bacterial infection probably dictates the outcome in most cases. In the 86 cases where pneumonia occurred as a complication of some other disorder, interstitial bronchopneumonia was present in 16%.

In interstitial bronchopneumonia the course may be acute and rapidly fatal, or else there may be an insidious onset and indefinite symptoms for some weeks.

The tissue reaction is primarily related to the bronchial tree and to the lymphatic pathways of the lung. It is relatively non-specific.

Thickening and increased cellularity of the walls of the air-spaces alone is difficult to assess objectively, and such assessment is much influenced by non-specific lung collapse and œdema. It is suggested that pathological diagnosis of interstitial pneumonia or pneumonitis should not be based on such changes alone.

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REFERENCES

Adams, J. M., Green, R. G., Evans, L. A., Black, N. (1942) *J. Pediat.* **20**, 405.

Baar, H. S. (1955) *J. clin. Path.* **8**, 19.

De Nardi, J. M., Van Ordstrand, H. S., Curtin, G. H., Zielinski, J. (1953) *Arch. industr. Hyg.* **8**, 1.

Dingle, J. H. (1947) Advances in Pediatrics. Edited by Levine, S. Z., Butler, A. M., Holt, L. E. jun., and Weech, A. A. New York.

Golden, A. (1944) *Arch. Path.* (*Lab. Med.*) **38**, 187.

Goodpasture, E. W., Auerbach, S. H., Swanson, H. S., Cotter, E. F. (1939) *Amer. J. Dis. Child.* **57**, 997.

Gruenwald, P., Jacobi, M. (1951) *J. Pediat.* **39**, 650.

Low, F. N. (1953) *Anat. Rec.* **117**, 241.

MacCallum, W. G. (1919) The Pathology of the Pneumonia in the United States Army Camps during the Winter of 1917–18. Monograph 10, Rockefeller Institute of Medical Research. New York.

Menten, M. L., McCloskey, G. A. (1951) *Amer. J. Path.* **27**, 477.

Pinkerton, H., Smiley, W. L., Anderson, W. A. D. (1945) *Ibid*, **21**, 1.

Reimann, H. A. (1947) *Medicine, Baltimore*, **26**, 167.

Wolman, M., Izak, G., Freund, E., Shamir, Z. (1952) *Amer. J. Dis. Child.* **83**, 573.

CLOSURE OF WOUNDS AND INCISIONS WITH ADHESIVE TAPE

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IN an analysis of the healing of surgical incisions (Gillman et al. 1955) we have described several phenomena not yet generally recognised, including vigorous epithelial downgrowths into the dermis in the line of the incision and especially along the sutures. These epidermal reactions, particularly well marked in relation to the needle-puncture wounds, always complicate wound healing considerably and contribute much to the ultimate scar. Consequently methods for sutureless closure of surgical incisions were sought.

After trying several published methods of closing skin incisions without sutures, including the use of ordinary zinc plaster-strips (Radcliffe 1943) and various combinations of plasma, bovine thrombin, and calcium (Tarlov et al. 1943, Young and Favata 1944, Mandl et al. 1946) we undertook a trial of transparent plastic adhesive tape.

On five ambulant active volunteers we made experimental incisions through the skin of the forearm and down to subcutaneous fat. These incisions, of which several were made in the skin of the forearm of the same person, were closed with adhesive plastic tape, and the results with this type of closure were compared with those obtained in another equivalent incision, in the same person, closed with fine interrupted silk sutures.

Methods

All the incisions, each 2 or 3 inches long, were deep enough to permit full gaping of the wound. In each case the control wound was closed with five or six size 0 black silk sutures in a no. 19 cutting needle.

For tape-closure we used at first a specially prepared adhesive plastic tape kindly provided by Dr. P. Williamson of the U.S. Army Hospital in Albuquerque, New Mexico, who informed us that the tape was "self-sterilising" but could be autoclaved. Subsequently, however, we tried ordinary plastic tape available in most stationery stores and found it quite as efficient. Since the adhesive of this type of plastic tape contains phenol and latex it is virtually self-sterilising. We have now used such ordinary stationery-type plastic tape in major plastic operations on the breasts and elsewhere without sterilising the tape at all and without any complicating infections. The tape was applied as follows:

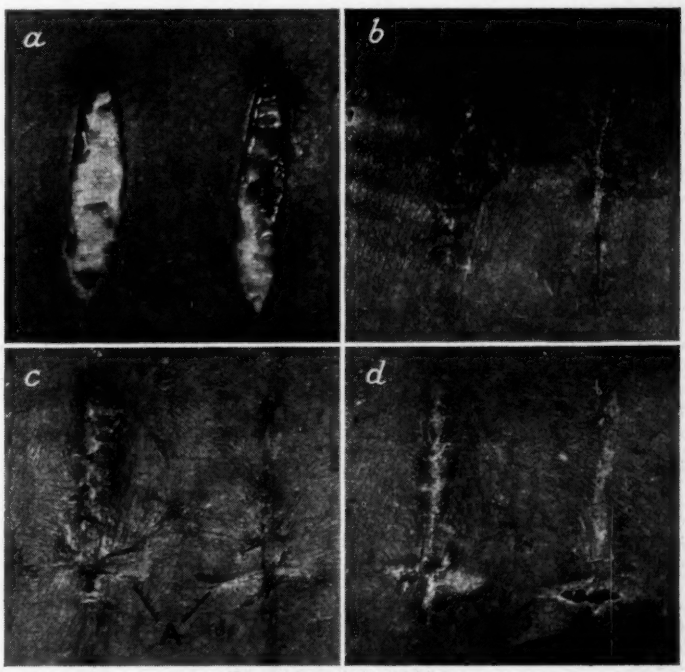
A piece of tape $2^1/_2$-3 inches long was used, and one end of it was applied, with firm pressure, about $1^1/_2$ inches away from the incision, to provide a firm grip on the skin. Then, by pulling on the free end of the tape, and simultaneously squeezing the wound edges together with the fingers, or by coapting them with fine forceps, the tape strip was firmly pressed on to the skin on the opposite side of the incision, once the operator was satisfied, on viewing the incision through the transparent tape, that the edges of the incision were correctly apposed. With only a little practice, almost hair-line closure was easily achieved.

A greater number of $^1/_4$-inch-wide strips was preferred to fewer strips of broader tape, since the narrower tape permitted more precise apposition and greater security. Successive strips of tape were applied with narrow intervals between each. The ends of the transverse strips of tape were then made more secure by fixing two broad pieces on each side, parallel to the incision, and across the ends of all the transverse strips.

Dressings of tulle gras, or of erythromycin ointment on dry gauze, and lint were applied, and these were covered with a crêpe bandage kept in place by plaster strips at the proximal and distal borders of the bandage. The volunteers then went about their daily duties, which varied from clerical or laboratory and animal-room work to mountaineering in one case. Thus healing took place under conditions which were far from the surgical ideal of complete rest, making these experiments rigorous tests of the method of wound closure.

Removal of the tape was facilitated by moistening the skin with 95% alcohol or preferably with ether, when necessary. In the case of the sutured wounds, alternate sutures were removed at five and at ten days after operation.

Three methods of making observations were used: (1) macroscopic inspection almost daily after the fifth



Tape-closure of skin incisions.

(*a*) Initial incisions.
(*b*) Sutured wound (left) and tape-closed wound (right) on 10th postoperative day. Note erythema and œdema of wound edges in sutured wound, and hairline closure of taped wound.
(*c*) Same wounds on 16th postoperative day when tape was removed from (transverse) biopsy wounds (A) made on 10th postoperative day. Note excessive pigmentation and scaling around sutured wound and absence of these from taped wound; also wrinkling of skin due to dressing.
(*d*) Wounds on 26th postoperative day, showing hyperpigmentation and suture scars around sutured wound, very fine scar of taped wound, and "spreading" of taped biopsy wounds (A) from which tape was removed prematurely. Original taped incision was kept taped for 10 days and has *not* spread.

postoperative day; (2) crude assessment of the tensile strength of the wounds at the time of biopsies; and (3) microscopy of serial sections of the biopsy specimens.

Results

As illustrated in the accompanying figure, the healing of the taped wounds was in every way as good as, and in many respects considerably better than, the sutured wounds. The edges of the latter were always somewhat inflamed and congested, especially in relation to the fine silk sutures. These reactions were clearly aggravated by the constant use of the incised arms and were greatest at the suture-needle puncture wounds. The localised inflammation associated with sutures, compared with the absence of such reactions in taped wounds, was particularly clear in an Asiatic (see figure).

So impressed were we with the results obtained with tape-closure in our first volunteer that we soon discarded suturing of biopsy wounds in favour of tape-closure.

Very little discharge was formed beneath the tape, and no volunteer complained of any irritation or discomfort attributable to the plastic tape used in the wound closure. Nor was there any accumulation of sweat beneath the tape, despite the fact that these experiments were made on active workers in the humid tropical climate of Durban. Ordinary zinc plaster or elastic plaster, on the other hand, caused itching and discomfort in several volunteers. It was found that covering the taped wounds with a second layer of plastic tape provides an excellent airtight comfortable dressing which has the added advantage of allowing frequent scrutiny of the incisions without disturbing either the patient or the wound.

At the fifth postoperative day the sutured wounds, probably owing to the presence of sutures themselves, seemed to be stronger, with less tendency to "split" when tension was applied, than the taped wounds. However, by the tenth postoperative day, especially when the tape had been left undisturbed all the time, the tensile strength of the taped wounds was equivalent to that of the sutured wounds. If tape is retained in position for fifteen days after operation, one may expect perfect hairline scars which do not "spread" after the removal of the tape.

We recognise that these findings are based on the study of relatively small incisions not quite so deep as the usual surgical incision—i.e., only down to subcutaneous fat and not to or through the fascia and/or muscle. But the conditions of the present tests were rigorous in that the surgically treated part was never placed at rest.

Remarks

For general surgical practice, in dealing with incisions extending through all the layers down to peritoneum, the usual sutures required for the closure of subcutaneous tissues are obviously still necessary. However, for the closure of extensive incisions in the skin alone all that is necessary is two or three widely spaced stay-sutures, sometimes with a few subcuticular stitches. For the rest, speedier and much better apposition of incised edges can be achieved by completing skin closure with plastic tape as described above. Spread of infection along sutures and suture-needle puncture scars are thus avoided. Drains, when required, can always be placed between strips of tape and, when superficial, can easily be taped into position.

Apart from the better healing and the better scar, tape-closure has the advantage of being simple and rapid. The patient is spared the discomfort, or even pain, attending removal of sutures, and the usually overworked nurses are saved the time and effort of taking down dressings repeatedly, in fulfilment of the common present-day practice of removing alternate sutures on different days. Healing is quicker because there is less interference with the operation site, especially if tape-closure is used alone without any dressings.

Our microscopical studies (Gillman et al. 1955) have provided reasons for diminishing the number of sutures used in closing the cutaneous portions of major surgical incisions and for discarding sutures entirely for skin closure whenever possible. Tape-closure, the most acceptable alternative, is also highly suitable for rapid wound closure in patients who are severely injured and shocked, and for treating minor injuries in general practice and in casualty wards. We have already found it useful in plastic surgery, and we believe that the use of adhesive tape will find other applications in surgery, especially in fixing split-skin and other free grafts to recipient sites, and wound closure in patients liable to keloid.

General Conclusions

A method is described for closing skin incisions with transparent plastic adhesive tape.

Preliminary tests show this method to be superior to closure with sutures.

It should have further trial for closing skin incisions in major surgery and in plastic surgery, for applying free skin-grafts, and in the emergencies of general practice and the casualty ward.

We are glad to acknowledge the generous grant from the Schlesinger Organisation, South Africa, which made the execution and presentation of this work possible. Messrs Eli Lilly kindly provided the erythromycin ointment here used. We also wish to thank our very willing and coöperative volunteers, Dr. S. H. Ripley, Dr. M. K. S. Hathorn, Mr. L. Farr, Mr. H. J. Klomfass, and Mr. K. Perumal, and Dr. P. Williamson for his collaboration.

REFERENCES

Gillman, T., Penn, J., Bronks, D., Roux, M. (1955) *Brit. J. Surg.* (in the press).
Mandl, F., Finkelstein, M., Rabinovici, N. (1946) *Acta med. orient.* **5**, 75.
Radcliffe, W. (1943) *Practitioner*, **150**, 122.
Tarlov, I. M., Denslow, C., Swarz, S., Pineles, D. (1943) *Arch. Surg.* **47**, 44.
Young, F., Favata, B. V. (1944) *War Med.* **6**, 80.

NEPHROSIS TREATED BY MALARIA

RESULTS IN 65 CASES

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IN 1952 Byrne and Gairdner independently reported cases of nephrosis in which remissions had been induced by infecting the patient with malaria. Following these reports the Malaria Reference Laboratory supplied many hospitals with infected blood or mosquitoes for the purpose of inducing malaria in nephrotic patients. The malaria was of the benign tertian variety, except in 2 instances where a second bout of fever was desired, when quartan malaria was used.

We report here the results of malaria treatment in 65 cases. Details of 55 cases were collected by making inquiries from the physicians concerned; 10 cases were personally studied by one of us (D. G.).

The intention was to find out: (1) what proportion of nephrotic patients are benefited by malarial treatment; (2) what hazards the treatment carries; (3) whether those patients with nephrosis who are likely to benefit from this treatment can be distinguished; and (4) whether the length and severity of the malaria are factors in its effectiveness in inducing a remission of nephrosis.

Material

Details of 72 cases of the nephrotic syndrome were available, but 7 of these were discarded because the effects of the malaria could not be assessed for the following reasons: in 4 cases death took place from causes unrelated to the malaria; in 2 cases a spontaneous remission of the nephrosis preceded the malarial pyrexia; in 1 case another treatment was given concurrently with malaria. There remained 65 cases.

51 cases fulfilled the conventional criteria of "pure nephrosis," showing gross œdema and proteinuria, hypo-albuminæmia, and hypercholesterolæmia but no hypertension or sustained azotæmia, and little or no hæmaturia.

Most of the remaining 14 cases showed, in addition to the nephrotic picture, well-marked hypertension and azotæmia, and nephritis was clearly present. In a few these signs were more equivocal; cases where the diagnosis was in doubt were classified with the nephritic group.

TABLE I—RESULTS OF MALARIA TREATMENT IN 65 CASES OF NEPHROSIS

Result	"Pure nephrosis" (51 cases)	Nephritic nephrosis (14 cases)
Complete remission	14	..
Partial remission	11	5
No remission	26	9

Immediate Results of Malaria Treatment

If a diuresis began any time after the onset of the malarial pyrexia and up to a week after the end of the pyrexia it was ascribed to the malaria. A *complete remission* was defined as loss of all œdema, sustained for at least three months; and a *partial remission* as one where the loss of œdema, although substantial, was either incomplete or was not sustained for three months.

The results in 65 cases of the nephrotic syndrome are shown in table I.

TABLE II—AGE-DISTRIBUTION OF CASES OF "PURE NEPHROSIS" WHICH HAD A COMPLETE REMISSION

Age (yr.)	"Pure nephrosis" (51 cases)	Complete remission (14 cases)
1–5	23	7
6–10	7	1
11–15	6	3
16–20	3	..
21–30	3	1
31–40	4	..
41–50	4	2
51–60	1	..

A remission, partial or complete, occurred in about half the "pure-nephrosis" group and in about a third of the nephritic group. A *complete remission*, however, was seen only in the "pure-nephrosis" group, in which it occurred in 14 of 51 cases—an incidence of 28%. Table II shows the age-distribution of the 14 cases which had a complete remission, and in table III additional details of these cases are set out—the duration of nephrotic symptoms; previous remissions, whether spontaneous or the result of treatment with either corticotrophin or cortisone; and the subsequent course.

A relapse of malaria sometimes initiated a nephrotic remission, after a primary attack of malaria had been ineffective, as in the following instance.

Case 24 (table III).—A boy, aged 11, had had nephrosis for four and a half years, with unrelieved œdema for three and a half years. He was infected with benign tertian malaria by mosquito bites and had pyrexia lasting thirteen days, terminated by a course of proguanil. There was no change in his nephrosis. Two months later (February, 1953) his temperature suddenly rose to 103°F and continued at about this level for eleven days before being brought under control by proguanil. Diuresis started on the third day of pyrexia, and his gross œdema rapidly cleared. He has subsequently (April, 1955) remained well and free from œdema, although a severe proteinuria persists.

Late Results of Malaria Therapy

The fate of the 14 patients who had complete remissions is summarised in table III. In 4 patients the nephrosis

TABLE III—DETAILS OF 14 CASES OF NEPHROSIS WITH COMPLETE REMISSION AFTER MALARIA

Case no.	Age (yr.)	Sex	Duration before treatment	Spontaneous remissions	Previous treatment with cortisone or corticotrophin	Late result
65	1½	F	10 wk.	..	..	Well 2 yr. later; no proteinuria; blood chemistry normal
16*	2	M	5 wk.	..	..	Well (except for proteinuria) for 2 yr., then relapse of nephrosis. Second treatment with benign tertian malaria followed by remission, and 3½ yr. after this well; no proteinuria; blood chemistry normal
42	3½	M	4 wk.	..	..	Well (except for trace proteinuria) for 9 mos., then relapsed; second malarial treatment (quartan) given 17 mos. after first treatment; death on 5th day of pyrexia
74	4	M	2 mos.	..	..	Well (except for proteinuria +) 5 mos. later; blood chemistry normal
29	4	M	7 mos.	..	..	Well 2½ yr. later; no proteinuria; blood chemistry normal
25	4½	M	2 yr.	Twice	1, corticotrophin; 2, cortisone; both caused transient partial improvement	Well (except for proteinuria + +) for 6 mos., then relapse of nephrosis
66	5	F	1 yr.	..	..	Well (except for proteinuria +) 6 yr. later; blood chemistry normal
22*	9	M	10 mos.	..	..	Well 1¼ yr. later; no proteinuria; blood chemistry normal
17	11	M	10 mos.	..	Cortisone twice; first course caused transient improvement	Well 2¼ yr. later; no proteinuria; blood chemistry normal
24	11	M	4½ yr.	One, 3 months after onset, lasting 9 mos.	..	Well 2 yr. later, but proteinuria + + (blood chemistry not available)
52	12	M	6 mos.	..	Corticotrophin, no effect	Well for 1 yr., then relapse; second malarial treatment (quartan) induced further remission; well 2¼ yr. later, no proteinuria, blood chemistry normal
71	24	F	8 mos.	..	1, corticotrophin, 2, cortisone; no effect	Well 7 mos., later, but proteinuria + +, serum cholesterol and albumin abnormal
13	43	F	5 wk.	..	..	Well 2¼ yr. later; no proteinuria; blood chemistry normal
28	46	F	4 mos.	..	Corticotrophin, no effect	Well 1½ yr. later, no proteinuria; blood chemistry normal

* Case 16 was reported by Byrne (1952), case 22 by Porter (1954).

relapsed after periods of six months, nine months, a year, and two years. Subsequently 3 of them were reinfected with malaria; this procedure apparently contributed to the sudden death of case 42 (see below) but was successful in initiating a long-lasting remission in the 2 other patients. The latter cases are instructive: case 16 because the proteinuria, which persisted after his first postmalarial remission, was abolished by the second malarial treatment; and case 52 because quartan malaria was used.

Case 16.—(Byrne 1952 and personal communication).—A boy, aged 2 years, who had nephrosis for six weeks was infected with benign tertian malaria and had pyrexia for ten days. Two days after the fever had been terminated he had a diuresis. Thereafter he remained free from œdema (except for transient "puffing up" of the face on two occasions following coryza), although continuing to have moderate proteinuria. After two years œdema recurred and benign tertian malaria was again induced, in August, 1951, the pyrexia being terminated after nine days. Seven days later diuresis began, with complete clearance of œdema, disappearance of proteinuria, and return of blood chemistry to normal—a state of affairs which has persisted for more than three and a half years.

Case 52 (case 2 of Gairdner 1952).—A boy, aged 12 years, had nephrosis for a year. Benign tertian malaria was then induced and was followed by loss of all œdema and a return to normal of the blood chemistry. During the next twelve months the boy remained well, his urine containing either a trace or no protein, but the œdema, gross proteinuria, and abnormal blood chemistry then recurred. Several unsuccessful attempts were made to infect him a second time with benign tertian malaria, but to this he proved immune. Quartan malaria was therefore induced by blood inoculation. After an irregular pyrexia for three weeks, latterly complicated by episodes of hæmaturia coinciding with rigors, diuresis set in, and again a complete remission followed. The boy has remained well for two and a quarter years since his second remission, with normal urine and blood chemistry.

Summary.—The late results in the 14 patients who had a complete remission were as follows: 10 patients have remained well; in 2 patients the œdema has recurred but has cleared after a second malaria treatment, both patients having remained well for more than two years; 1 patient has died; and in 1 patient the œdema has returned. Of the 12 patients who were still well in May, 1955, the follow-up period had been six years in 1 case, three years in 1 case, two years in 5 cases, a year in 3 cases, and from five to seven months in 2 cases. The urine was normal in 8 cases, but proteinuria persisted in 4. The blood chemistry (urea, serum proteins and cholesterol) was normal in 10 cases, abnormal in 1, and unknown in 1.

Factors Influencing Results of Malaria Therapy

By comparing the 14 cases which showed a complete remission (malaria-responsive) with the 37 cases of "pure nephrosis" which did not (malaria-unresponsive), it was found that the age, sex, and duration of nephrosis did not differ significantly between the two groups.

Spontaneous remissions had previously occurred in 2 of the 14 malaria-responsive cases, and in about the same proportion of malaria-unresponsive cases.

Nine courses of corticotrophin and/or cortisone had been given to 5 of the 14 malaria-responsive cases but in none had produced more than transient partial improvement; hence lack of response to these agents did not imply that malaria treatment would fail.

The height of the malarial pyrexia and the length of time it was allowed to continue were factors which, it was anticipated, would influence the success of malaria therapy, but the data did not support this conjecture. In 5 of the 14 malaria-responsive cases the pyrexia lasted less than two weeks, and in 1 of these cases the temperature never rose above 102°F. Conversely, in many of the malaria-unresponsive cases pyrexia had lasted two or three weeks with temperatures exceeding 105°F.

Thus there seems to be no way of recognising which patients with nephrosis will respond to malaria, except that, if there are signs of nephritis, they are most unlikely to do so.

Some observations may, however, be offered on the criteria for judging whether a nephrotic remission following malaria is likely to prove long-lasting. (Probably the same criteria would apply to nephrotic remissions induced by other means.) Unless the œdema is completely cleared and is followed within a few weeks by a return to normal of the serum-albumin and serum-cholesterol levels, relapse is probable. A raised α_2-globulin level may, by contrast, persist for many months without implying that relapse is likely. Moderate proteinuria also does not necessarily indicate impending relapse, and 4 of the 12 patients who remain well to date have a residual proteinuria, which may signify damage done to the kidneys in the past rather than a continuance of the nephrotic state.

Dangers of Malaria

Malaria was thought to have contributed to the death of 1 patient, although the exact cause of death was obscure:

Case 42.—A boy, aged 3½ years, had had nephrosis for two months before benign tertian malaria was induced in October, 1953, pyrexia being allowed to continue for two weeks. A nephrotic remission followed, the œdema cleared, the blood chemistry became less abnormal, and proteinuria was much diminished. The boy remained well for nine months until œdema recurred in August, 1954, with ascites and gross albuminuria. Various treatments, including corticotrophin, were tried in vain. Since the boy became immune to attempted reinfection with benign tertian malaria, quartan malaria was induced by blood inoculation. On March 19, 1955, pyrexia began, with temperatures continuing between 100°F and 102°F until March 22, parasites being present in the blood. From March 23 he remained afebrile, but became progressively feebler; he died suddenly and unexpectedly on March 25. Necropsy was not permitted.

Anæmia develops in a large proportion of nephrotic patients given malaria. Usually the hæmoglobin level returns rapidly to normal after termination of the malaria, especially if iron is given. However, in 6 patients, 4 of them children, the anæmia was severe enough to require blood-transfusion.

Case 52 (see above) developed hæmaturia but later made a seemingly complete recovery from nephrosis, his urine becoming normal. Hæmaturia also complicated 2 of the cases of nephrosis treated by malaria by Shaper (1955).

We conclude that malaria may sometimes prove a drastic treatment, since patients are often already in a seriously weakened state, but that most patients tolerate it surprisingly well, especially since the pyrexia can be modified by the use of 'Thio-Bismol' (Whelen and Shute 1943) or terminated at will by quinine, mepacrine, or proguanil.

The hazards of malarial treatment must be viewed in perspective against the mortality of the disease itself. At least 8 patients in this series are known to have died from the direct or indirect effects of nephrosis. Nor is hormone therapy with corticotrophin or with cortisone, currently the most usual form of treatment, without danger; Metcoff et al. (1952) reported 4 deaths as a result of corticotrophin administered to 45 children.

Course of Nephrosis in Malaria-induced Remission

In 4 of the cases observed by one of us (D. G.), where partial or complete remission followed malaria, it was possible to follow the day-to-day changes in the plasma-cholesterol levels, the electrophoretic pattern of the plasma-proteins, the eosinophil-count, and the proteinuria (figs. 1 and 2).

The first change affects the plasma-cholesterol level, which declines steadily from the beginning of the pyrexia,

reaching normal or near normal levels within about two weeks.

The next change has been a rise in the γ-globulin level, typically depressed in nephrosis. This rose sharply on the tenth day in the case shown in fig. 1; in other cases a similar change took place at about the same time, though the rise was not so clear-cut in those cases where the initial depression of γ-globulin was less pronounced (fig. 2).

Diuresis, when it took place, began in some instances during the pyrexia, but more often a day or two after its termination, and proteinuria usually diminished sharply at the same time as diuresis set in. Several days then elapsed before the serum-albumin level started to rise. An abnormally high level of α_2-globulin persisted long after all other clinical and chemical evidence of nephrosis had cleared; in case 65 the α_2-globulin became normal only fifteen months after œdema and proteinuria had disappeared and the serum-albumin and serum-cholesterol levels had returned to normal.

Fig. 1 displays the sequence of events in a case which had a complete remission, and fig. 2 where the remission was partial and transient.

It is obviously of interest to know whether the pattern of events is the same in a nephrotic remission, irrespective of whether the remission is spontaneous or is induced by such agents as infection, corticotrophin or cortisone, dextran, and nitrogen mustard. Measles-induced remissions have been studied by Blumberg and Cassady (1947) and Janeway et al. (1948); hormone-induced remissions by Luetscher and Deming (1950), Metcoff et al. (1952), Heymann et al. (1955), and others; and nitrogen-mustard induced remissions by Kelley and Panos (1952). It seems that, in remissions induced by each of these three types of agent, diuresis begins either at the same time as proteinuria sharply diminishes or a day or two after this. The serum-albumin level begins to rise only after diuresis is well under way (one of a number of facts which indicate that hypoproteinæmia is not the cause of nephrotic œdema). In these studies the cholesterol level showed no decided fall until after other signs of remission had become evident.

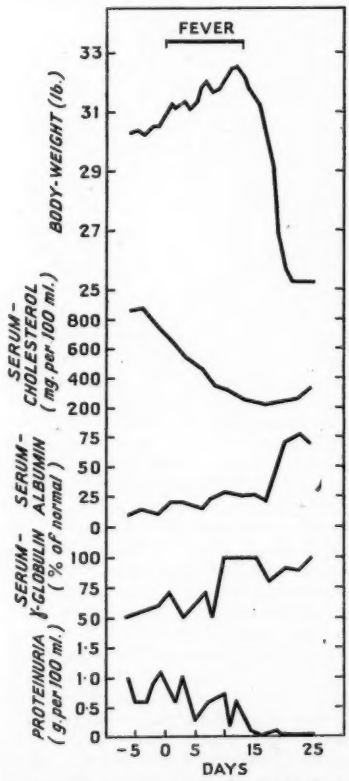

Fig. 1—Case 65: course of nephrosis (weight; serum-cholesterol, serum-albumin and serum-γ-globulin levels; and proteinuria) following malarial pyrexia. The remission in this case lasted a long time.

When remissions induced by malaria are compared with those induced by other agents, it is seen that the pattern is essentially the same in both. The only obvious difference is that in malaria-induced remissions the cholesterol level starts to fall steadily from the onset of pyrexia and well before any other changes in the signs of nephrosis have appeared. This may be due to the same mechanism by which malarial pyrexia depresses the cholesterol level in healthy people (Fairley and Bromfield 1933). Possibly, therefore, the fall in the cholesterol level has nothing to do with the initiation of the nephrotic remission, and this view is supported by the fact previously noted (Gairdner 1952) that hypercholesterolæmia disappears in nephrosis treated by malaria, irrespective of whether or not remission follows.

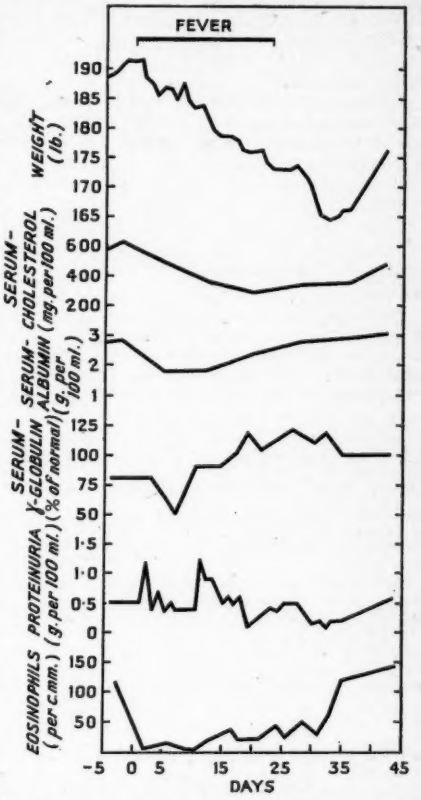

Fig. 2—Case 49: course of nephrosis (weight; serum-cholesterol, serum-albumin and serum-γ-globulin levels; proteinuria; and eosinophil-count) following malarial pyrexia. The remission in this case did not persist, œdema and proteinuria clearing only transiently. Note eosinopenia induced by malaria.

The production of eosinopenia (in 3 of the 4 cases observed) by an attack of malaria (fig. 2) is consistent with the view that the ability of this infection to provoke a nephrotic remission depends partly on adrenocortical stimulation. McCall and Singer (1953) observed that a nephrotic patient who developed a severe infection leading to a remission might excrete as much corticoid hormone as when given corticotrophin. However, additional factors may well operate, and this possibility is supported by the observation that many of the malaria-responsive patients with nephrosis had previously received one or more courses of either corticotrophin or cortisone with little effect.

It is tempting to speculate further on the mechanism of malaria-induced remissions; but, in view of our fundamental ignorance of the cause of nephrosis, such speculations would be nugatory.

Summary and Conclusions

Of 65 patients with the nephrotic syndrome treated with malaria 51 had "pure nephrosis"; 14 (28%) of these achieved remissions lasting longer than three months, and 12 (24%) have remained well subsequently, with follow-up periods of up to six years.

No lengthy remission occurred among 14 cases of nephritic nephrosis. Apart from this no criteria were

found by which the likelihood of remission could be judged. Lack of response to either corticotrophin or cortisone did not imply that a nephrosis would not respond to malaria.

1 death was partly ascribable to the malaria. The only common complication of this treatment was anæmia, which sometimes necessitated blood-transfusion.

Nephrosis is a long and disabling illness, carrying still a considerable mortality. While its ætiology remains obscure, only empirical treatments exist. Among these malaria has a place, since long-lasting remissions can be induced in about 1 in 4 patients with "pure nephrosis," sometimes after hormone treatment has failed.

This study has depended entirely on the goodwill of some 60 physicians, too numerous to name, who have been generous in providing us with many facts about their patients and in granting us permission to use this information. We take this opportunity of expressing our warm thanks to them.

REFERENCES

Blumberg, R. W., Cassady, H. A. (1947) *Amer. J. Dis. Child.* **73**, 151.
Byrne, E. A. J. (1952) *Lancet*, i, 844.
Fairley, N. H., Bromfield, R. J. (1933) *Trans. R. Soc. trop. Med. Hyg.* **27**, 289.
Gairdner, D. (1952) *Lancet*, i, 842.
Heymann, W., Gilkey, C., Salchar, M. (1955) *Pediatrics*, **15**, 49.
Janeway, C. A., Moll, G. H., Armstrong, S. H., Wallace, W. M., Hallman, N., Barness, L. A. (1948) *Trans. Ass. Amer. Physcns*, **61**, 108.
Kelley, V. C., Panos, T. C. (1952) *J. Pediat.* **41**, 505.
Luetscher, J. A. jun., Deming, Q. B. (1950) *J. clin. Invest.* **29**, 1576.
McCall, M. F., Singer, B. (1953) *J. clin. Endocrin.* **13**, 1157.
Metcoff, J., Rance, C. P., Kelsey, W. M., Nakasone, N., Janeway, C. A. (1952) *Pediatrics*, **10**, 543.
Porter, R (1954) *Brit. med. J.* ii, 1398.
Shaper, A. G. (1955) *Ibid*, i, 1132.
Whelen, M., Shute, P. G. (1943) *J. trop. Med. Hyg.* **46**, 1.

PREOPERATIVE PREPARATION OF THE BOWEL WITH NEOMYCIN

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THE ability to suppress the intestinal flora has profoundly altered the management and prognosis of large-bowel surgery. Before the introduction of intestinal antisepsis, primary intraperitoneal anastomosis carried a high risk of infective sequelæ, either with or without an actual leak at the site of anastomosis. Devine (1940), discussing resection of carcinoma of the proximal colon, suggested that the over-all mortality-rate of a right-sided hemicolectomy was as high as 35%, and that of primary anastomosis in the distal colon 30%. He also advocated that resection and anastomosis of the sigmoid colon should be done only after it had been completely isolated by a "disconnecting" colostomy. This operation and its many modifications were universally adopted by surgeons who were constantly preoccupied with the dangers of operating on bowel containing pathogenic organisms.

Since the introduction of bacteriostatic and bactericidal drugs and in the absence of obstruction it has become possible to perform intraperitoneal resection of large bowel with reasonable safety and without a previous defunctioning colostomy. The presence of obstruction prevents effective sterilisation of the bowel and for this and other reasons remains an absolute indication for preliminary decompression. The dramatic improvement in the mortality-rate following preoperative sterilisation of the bowel is indicated by Allen (1950), who reported 159 resections of carcinoma of the colon with only 2 deaths, a mortality-rate of 1·2%.

The drugs available for sterilising the bowel before surgery are those of the slowly absorbed sulphonamides and the antibiotics. Of the sulphonamides, phthalylsulphathiazole is in common use, and a course of it lasting from three to five days has been found effective in inhibiting the fæcal flora to such a degree that the infective risks of operating on the large intestine can be largely eliminated (Poth and Ross 1944).

Trials of antibiotics for the same purpose have generally proved disappointing. The exhibition of streptomycin leads to the development of resistant strains within a few days. Chlortetracycline (aureomycin), chloramphenicol, and oxytetracycline depress the intestinal flora effectively but often produce toxic side-effects, such as nausea, diarrhœa, and vomiting. Another and more serious limitation in the use of these broad-spectrum antibiotics is the occasional development of a severe and often fatal secondary intestinal infection with resistant strains of staphylococci. The dangers of such a staphylococcal enterocolitis were summarised recently by Fowler (1955).

Neomycin as an Intestinal Antiseptic

Neomycin was isolated by Waksman and Lechevalier (1949) from *Streptomyces fradiæ*. It is water-soluble, thermostable, and bactericidal in vitro against a wide range of gram-negative and gram-positive bacteria. Its parenteral administration is limited by its toxic effects, such as renal damage, tinnitus, and deafness. The local application of neomycin ointment has been found effective in the treatment of pyogenic skin disease (Church 1954).

Oral administration of neomycin is not accompanied by toxic side-effects, for little is absorbed from the bowel. This antibiotic has the additional advantage of remaining unchanged in the gastro-intestinal tract (Poth et al. 1950) and has been used successfully in various intestinal infections, including amœbiasis and bacillary dysentery (Waksman 1953). As compared with streptomycin the incidence of drug resistant strains is found to be low. Its use as an orally administered intestinal antiseptic was investigated by Poth and his co-workers and favourably commented upon (Poth et al. 1950, 1951a). Its bactericidal action is rapid; it was shown in 154 patients who received 1 g. of neomycin by mouth every four hours that the bacterial flora of the bowel was reduced to less than 100 organisms per gramme of wet stool in twenty-four to forty-eight hours (Poth et al. 1951b).

The results of a trial of neomycin as a preoperative bowel antiseptic in 50 cases have been published by Davis et al. (1954), who emphasised the importance of a three-day preoperative régime of saline cathartics and a low-residue diet, basing this requirement on the suggestion by Baker and Pulaski (1950) that intestinal antiseptics are much more effective if the solid fæcal matter in the colon is removed before the drug is administered. Half their patients received a single dose of neomycin 4 g. twenty-four hours before operation, while the remainder were given neomycin 1 g. four-hourly for twenty-four hours preoperatively. Their results indicate that, with either therapeutic régime, neomycin effectively suppressed all intestinal bacteria without the development of resistant forms. Overgrowth of yeasts and fungi was not demonstrated. Complete details of the operations on these patients were not given, however; nor were the clinical results indicated.

The present trial was therefore instituted to assess the use of neomycin in the preparation of the large bowel for surgery and to determine the optimal dose of neomycin for the suppression of fæcal pathogens of surgical importance. The dose of neomycin is also correlated with the clinical result.

Material

Altogether 51 unselected patients were investigated who were expected to undergo major colonic surgery, but 16 of them either had no operation or else only a palliative colostomy, and these have been eliminated from this trial. The operations on the remaining 35 patients were:

Operation	No. of cases
Right hemicolectomy	7
Abdomino-perineal resection of rectum	14
Left hemicolectomy	3
Anterior resection of rectum with primary anastomosis	5
Hartmann's operation	1
Re-forming of colostomy	1
Closure of colostomy	3
Rectosigmoidectomy	1

Methods

Either a specimen of fæces or a rectal swab was submitted for bacteriological examination forty-eight hours before operation. Liquid paraffin $^1/_2$ oz. and 'Milk of Magnesia' 2 drachms were given by mouth twice daily for seventy-two hours before operation, during which time a low-residue semi-fluid diet was permitted. Twenty-four hours before operation treatment with oral neomycin was begun, either 1 g. four-hourly (régime A, 14 cases) to a total of 6 g. or 1 g. hourly for 4 doses, followed by 1 g. four-hourly for the rest of the twenty-four hours (régime B, 21 cases) to a total of 9 g.

At operation a swab for bacteriological examination was taken either from the lumen of the colon at the site of operation or from the operation specimen immediately after removal, according to the type of operation.

Bacteriological Findings

The trial was mainly clinical, but it was thought desirable to determine whether in fact the bowel was sterilised and to detect the emergence of any resistant strains.

A specimen of fæces or a rectal swab taken forty-eight hours before the operation was examined as follows: the first 9 specimens were cultured on blood-agar containing 16 μg. of neomycin per ml. The remaining 26 pre-drug specimens were cultured in digest broth containing 16 μg. of neomycin per ml. and then plated out on plain blood-agar. Swabs taken at operation were cultured on plain blood-agar.

The sensitivity to neomycin of all organisms isolated was determined by inoculation of serial dilutions of standard neomycin in Fleming's medium (May et al. 1947). The range covered was 500·000–0·007 μg. of neomycin per ml. Specimens from 35 cases were examined. These cases were divided into two groups: régimes A and B.

Régime A

14 cases are included in this group. The pre-drug specimens yielded predominantly enterococci and *Escherichia coli*, and less frequently yeasts and proteus. All the organisms isolated were sensitive to 125 μg. neomycin per ml., or less. One specimen yielded a *Bacterium aerogenes* sensitive to 0·5 μg. neomycin per ml.

Of the swabs taken at operation 29% were sterile, 22% yielded a mixed growth of an enterococcus and *Esch. coli*, 14% grew a yeast, and 14% an enterococcus alone. The remaining three specimens yielded a mixed growth of *Pseudomonas pyocyanea*, an enterococcus, and *Esch. coli*; a yeast and enterococcus; and *Esch. coli*. In no case was an organism more resistant to neomycin after operation than it had been preoperatively.

Régime B

21 cases are included in this group. As in régime A, the predominant organisms isolated from the pre-drug specimens were enterococci and *Esch. coli*. One specimen yielded a micrococcus, and one a diphtheroid. Again all the organisms isolated were sensitive to 125 μg. neomycin per ml. or less. Of the swabs taken at operation 45% were sterile, 15% grew *Esch. coli*, and 20% grew a yeast. The remaining four specimens grew *Ps. pyocyanea*, an enterococcus, a proteus, and mixed *Esch. coli* and yeast. Apart from yeasts, no organisms were isolated which were completely resistant to neomycin.

Poth et al. (1950) reported the persistence of *Bact. aerogenes* in 3 cases prepared with orally administered neomycin. In this series *Bact. aerogenes* was isolated from one pre-drug specimen only, and this was sensitive to 0·5 μg. neomycin per ml. *Staphylococcus pyogenes* was not isolated either before or after operation, but no special attempt was made to isolate it.

Clinical Results

None of these operations was fatal, and there was no intraperitoneal infection or sepsis in the abdominal incisions. In the cases of abdomino-perineal resection the perineal wounds healed satisfactorily in the normal manner. There was no systemic reaction to neomycin, no intolerance of neomycin, and no toxic side-effect.

Comment

In these cases neomycin sufficiently suppressed the fæcal flora for intraperitoneal bowel anastomosis to be undertaken with safety.

No instance of staphylococcal enterocolitis followed the use of neomycin in this small series; and, so far as can be ascertained, no such complication has been reported in America, where the drug has been in use on a wider scale for a considerable period. Similarly, intestinal moniliasis, which also may complicate oral antibiotic therapy, has not been reported as following neomycin therapy (Waksman 1953).

The failure of neomycin-resistant strains to develop after the clinical use of neomycin corroborates the findings of Davis et al. (1954). Poth et al. (1951b), however, found in 3 of their patients a resistant strain of *Bact. aerogenes* and indicated that it might therefore be desirable to give a supplementary course of phthalylsulphathiazole to eliminate this pathogen. In this present trial we did not discover any neomycin-resistant strain of *Bact. aerogenes*.

The main advantage of using neomycin, compared with other forms of preoperative drug therapy, is that the bowel can apparently be safely prepared for surgery within twenty-four hours. Although there was no apparent difference in the clinical results in régime A and régime B, the results of bacteriological assay indicate that 9 g. of neomycin given over twenty-four hours suppresses the bowel flora far better than do other drugs and therefore produces optimal conditions. As with other forms of preoperative bowel sterilisation, intestinal obstruction diminishes the effect of neomycin.

We emphasise, however, that the presumed sterility of the bowel lumen should in no way excuse any deviation from the exact and carefully performed technical minutiæ which are the foundation of successful bowel surgery.

Summary

35 cases requiring major bowel surgery were prepared with oral neomycin.

In 14 cases neomycin 1 g. was given four-hourly for twenty-four hours preceding operation (régime A); in the remaining 21 neomycin 1 g. was given hourly for 4 doses, followed by 1 g. four-hourly for the remainder of the twenty-four hours (régime B).

Complete sterilisation of the bowel was achieved in 29% of the cases under régime A, and in 45% of the cases under régime B.

No neomycin-resistant organisms developed.

There was no difference in the clinical results obtained with the two methods of preparation.

None of the operations was fatal, and there was no intraperitoneal infection or wound sepsis.

We are indebted to the consultant surgeons of the Royal Infirmary, Sheffield, for permission to cite their cases; to Prof. R. P. Jepson for his advice in the preparation of this report; and to Dr. J. Colquhoun for advice in the bacteriological investigations. The Upjohn Company supplied 'Mycifradin,' the brand of neomycin sulphate used in this trial.

REFERENCES

Allen, A. W. (1950) *Ann. R. Coll. Surg. Engl.* **7**, 173.
Baker, H. J., Pulaski, E. J. (1950) *Ann. N.Y. Acad. Sci.* **53**, 324.
Church, R. (1954) *Brit. med. J.* i, 314.
Davis, J. H., Kuhn, L. R., Schaffer, J. R., Amspacher, W. H. (1954) *Surgery*, **35**, 434.
Devine, H. (1940) The Surgery of the Alimentary Tract. Bristol.
Fowler, B. J. (1955) *Brit. med. J.* i, 1313.
May, J. R., Voureka, A. E., Fleming, A. (1947) *Ibid*, i, 627.
Poth, E. J., Fromm, S. M., Martin, R. G., Hsiang, C. M. (1951a) *Sth med. J.* **44**, 226.
— — Wise, R. I., Hsiang, C. M. (1950) *Texas Rep. Biol. Med.* **8**, 353.
— Martin, R. G., Fromm, S. M., Wise, R. I., Hsiang, C. M. (1951b) *Ibid*, **9**, 631.
— Ross, C. A. (1944) *J. lab. clin. Med.* **29**, 785.
Waksman, S. A. (1953) Neomycin. New Brunswick.
— Lechevalier, H. A. (1949) *Science* **109**, 305.

PHYSICAL GROWTH AND THE PROGRESS OF MYOPIA

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HAVING previously shown that myopic children grow faster and more irregularly than other children (Gardiner 1954), I have now studied their growth-rates in greater detail.

142 myopes were weighed at the beginning and end of a period of six months, and their proportional annual increase in weight was calculated from the figures thus obtained. Table I shows that in active myopes this increase was half as much again as in stationary myopes.

TABLE I—MEAN DIFFERENTIAL INCREASE IN WEIGHT OF MYOPES IN SIX MONTHS

Myopia	Stationary	Active		
		Change not measured*	−1·0 D or less yearly increase	> −1·0 D yearly increase
No. of myopes	23	86	22	11
Mean proportional annual increase in weight ..	0·081	0·084	0·105	0·125

* Judging by change in visual acuity, myopia had increased, but not to an extent necessitating examination with a view to change of glasses.

A further series of 43 unselected myopes were studied for a year. They were weighed and measured at regular intervals, and their refractive errors were measured at the beginning and end of the year. It was found that 12 remained stationary, 23 increased by amounts of −1·0 dioptre (D) or less, and 8 increased by amounts greater than −1·0 D. Table II shows for each group the mean proportional increase in height and weight over the year.

TABLE II—DIFFERENTIAL INCREASES IN HEIGHT AND WEIGHT OF MYOPES IN A YEAR

Myopia	Stationary	Active	
		−1·0 D or less	> −1·0 D
No. of myopes	12	23	8
Mean proportional increase in weight	0·102	0·104	0·135
Mean proportional increase in height	0·037	0·045	0·046

TABLE III—MEAN WEIGHT INCREMENTS CORRELATED WITH ACTUAL YEARLY DIOPTRIC INCREASE

Actual dioptric increase per annum	Actual mean increment of weight (lb.) per annum
0·0	9·2
0·25	7·5
0·75	8·0
1·0	7·2
1·25	8·0
1·5	12·0
2·0	16·0

The children with more active myopia increased in weight a third as fast again as those with stationary myopia, and in height about a quarter as fast again. This is rather less than the greatest difference found previously between myopes and others.

The differences in physical growth are expressed in more detail in figs. 1–3, where the proportional increase in myopia is used instead of the actual increase.

Curves B in figs. 4 and 5 show that it is quite possible for a child to become more myopic even if his rates of increase in height and weight are less than those of a stationary myope of comparable initial weight or stature.

Discussion

The number of patients is too small to permit statistical analysis; but the results are in line with my previous observation that a high level of myopia at a given age was associated with a high weight-height ratio. In my previous work there was also an indication that myopia increased during periods of rapid growth, and the present results show more precisely that the faster myopia progresses the faster the child grows. This can be demonstrated in a period as short as six months (table I). Individual exceptions, however, are common (figs. 4 and 5).

If the actual increase in weight is used, the picture becomes much less clear. In fact the actual weight increment of active myopes is less than that of stationary myopes up to increases of −1·25 D. Even so, the incre-

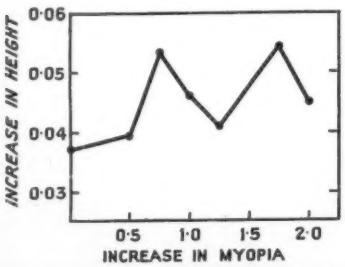

Fig. 1—Average proportional increase in height related to average proportional increase in myopia in a year.

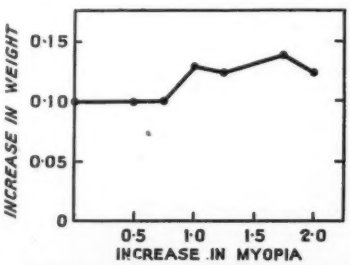

Fig. 2—Average proportional increase in weight related to average proportional increase in myopia in a year.

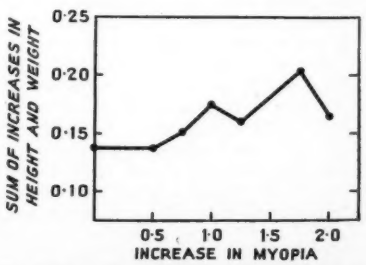

Fig. 3—Sum of average proportional increases in height and in weight related to average proportional increase in myopia in a year.

ment is highest among the myopes whose refraction has changed the most (table III).

There is therefore no simple rule whereby an increase of myopia in a child can be predicted from an increase in growth-rate, unless the initial height and weight are taken into account, and even then there will be exceptions.

The figures show that the mean rates of proportional increase in height and weight are usually higher in active myopes than in stationary myopes, and that the differences in rates of growth get bigger as the myopia progresses.

Most of these observations were made in terms of weight because it is easier to measure than height. Since

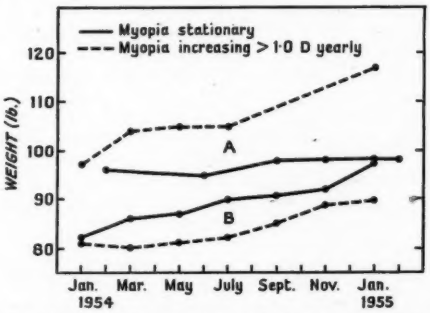

Fig. 4—Individual actual increases in weight of two pairs of myopes—one stationary, the other progressive (> −1·0 D in a year)—of comparable initial weight. Pair A illustrate the difference in growth-rate usually seen while pair B represent the exceptions.

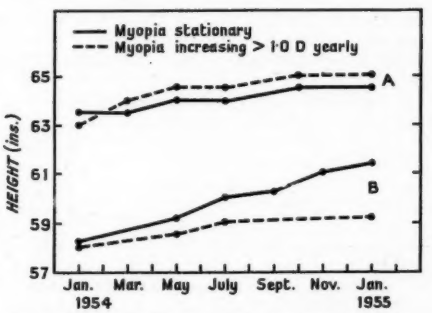

Fig. 5—Similar curves for actual increases in height.

these children are healthy, their weight increase as a group is probably a fairly accurate indicator of their rate of growth. Exceptionally, however, height may increase while weight remains relatively stationary, and vice versa. Fig. 3 shows the curve obtained by adding the proportional changes in height and those in weight.

Neither height increase nor weight increase is more closely associated than the other. The sum of the two gives a closer measure of the chances of an increase in myopia than either separately.

Summary

The differential growth-rates of active and stationary myopes were studied for a year.

The progress of myopia in children is closely related to the rate of their growth.

As expected, it was found that, in general, the more active the myopia the greater were the growth changes; but there were exceptions.

REFERENCE

Gardiner, P. A. (1954) *Lancet*, i, 476.

DO TRANSPLACENTAL HORMONES CAUSE ECLAMPSIA?

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ECLAMPSIA, although described by Hippocrates 2400 years ago, was reported by the Ministry of Health (1950) as being "Now much the most frequent and the most baffling cause of maternal death."

Hamlin (1952) says that the earliest sign in pre-eclampsia is an excessive gain of weight between the 20th and 30th weeks of pregnancy, and at his hospital in Sydney eclampsia is seemingly being eradicated by preventing excessive gains with a diet that is low in carbohydrates but high in proteins and vitamins.

Hamlin says that the second important sign appearing in pre-eclampsia, usually about the 31st or 32nd week, is swelling of the fingers, severe enough to cause patients to remove their rings. He has called this œdema of the fingers prehypertensive pre-eclampsia. The fact that he did not refer to œdema of the feet is interesting, because it suggests that pedal œdema is not a constant finding in eclampsia.

Observations on Œdema

RELATION OF ŒDEMA TO PARITY

With only limited obstetric material available in general practice, I obtained information about œdema in pregnancy at first by questioning my patients, some of whom had been confined outside the practice in Reading or in other parts of the country. In 1000 patients, who between them had had 2312 confinements, œdema of the feet unaccompanied by œdema of the fingers was reported by 13·9% of the primiparæ and 14·5% of the multiparæ.

Œdema of the fingers was commoner in the primiparæ, being found in 13·4% of 1000 first pregnancies and only 8·8% of 1312 subsequent pregnancies. In this predilection for primigravidæ, particularly the younger primigravidæ, œdema of the fingers resembles eclampsia and differs from pedal œdema, which affected primiparæ and multiparæ nearly equally.

RELATION OF ŒDEMA TO SEX OF FŒTUS

Of 506 male-bearing primiparæ 18·4% reported œdema of the fingers, compared with 8·3% of the 494 primiparæ who bore girls. Of multiparæ 8·8% of the 647 who bore boys and 8·9% of the 665 who bore girls had œdema of the fingers.

When there was only pedal œdema, neither primiparæ nor multiparæ showed a significant difference between the numbers of male and female offspring; but 98·9% of the mothers who had swollen fingers reported also swelling of the feet.

Evidence based on retrospective interrogation is open to numerous criticisms; yet the fact that the œdema reported had been sufficient to make a lasting impression on the mother's memory suggested that the swelling had been considerable. A prima-facie case for further investigation seemed therefore to have been established.

CLINICAL CORROBORATION

At every subsequent examination I asked the patients about œdema, in case œdema should be absent at the time of examination but present at other times. On the record card of each patient the absence or presence of œdema was noted, and, if present, its situations in hands, feet, or both. Any unusual tightness of the ring was recorded as œdema of the fingers, irrespective of whether it became necessary to remove the ring. Many minor degrees of swelling were thus included, and, as a result,

it became clear that œdema was very common in the second half of pregnancy.

Of the 502 patients examined 174 were primiparæ and 328 multiparæ. The primiparæ bore 93 boys and 81 girls, and the multiparæ bore 159 boys and 169 girls.

Situation of Œdema

There was œdema in either hands or feet in exactly half (50·0%) the 502 patients: 21·3% had œdema of the feet but not of the fingers; 23·3% had œdema of the feet and the fingers; and 5·4% had œdema of the fingers but not of the feet. When the œdema was present in both hands and feet it usually appeared from one to four weeks earlier in the feet than in the fingers.

Œdema of feet.—When there was no accompanying œdema of the fingers, pedal œdema was rather commoner in multiparæ than primiparæ and in mothers (both primiparæ and multiparæ) who bore boys than in mothers who bore girls:

18 of 93 (19·4%) of primiparæ who bore boys
14 of 81 (17·3%) ,, ,, girls
41 of 159 (25·8%) of multiparæ ,, boys
36 of 169 (21·3%) ,, ,, girls

Œdema of fingers.—Œdema of the fingers, with or without pedal œdema, was found in 43·7% of the primiparæ but only 20·7% of the multiparæ. Its incidence also differed strikingly in primiparæ according to the sex of the baby, being 52·7% in those who bore boys and 33·3% in those who bore girls. In multiparæ the incidence of œdema of the fingers did not vary appreciably with the sex of the baby:

49 of 93 (52·7%) of primiparæ who bore boys
27 of 81 (33·3%) ,, ,, girls
34 of 159 (21·4%) of multiparæ ,, boys
34 of 169 (20·1%) ,, ,, girls

These figures confirm the findings reached earlier by questioning the mothers, but also they showed even more emphatically a connection between the sex of the baby and the presence of œdema in the mother, the relationship being most apparent when the mother was a primipara and the œdema affected the fingers.

Time of Onset of Sex-linked Œdema of Fingers

The earliest development of œdema of the fingers was at the 24th week, but in most cases it appeared between the 28th and 38th weeks, the peak period being shortly after the 30th week, confirming Hamlin's (1952) finding:

4% between the 24th and 27th weeks
18% ,, ,, 28th ,, 30th ,,
42% ,, ,, 31st ,, 34th ,,
34% ,, ,, 35th ,, 38th ,,
2% ,, ,, 39th ,, 40th ,,

Relation of Sex-linked Œdema of Fingers to Preceding Maternal Weight

The œdema of the fingers usually appears to be related to the amount of weight gained between the 20th and 30th weeks. Large gains—e.g., 18 lb. or more—during those ten weeks are regularly followed first by œdema of the fingers and later by considerable hypertension and albuminuria. Moderate gains of 10–12 lb. are often followed by œdema of the fingers, but the subsequent hypertension and albuminuria are generally slight. The smallest gains during pregnancy are seen in rapidly reproducing multiparæ, and these are never accompanied by œdema of the fingers.

Relation of Sex-linked Œdema of Fingers to Subsequent Maternal Weight

Women who do not get œdema, hypertension, or albuminuria usually gain weight more slowly in the last two months of pregnancy than in the preceding months; their rate of gain is sometimes cut by half. This reduction takes place in those weeks during which œdema is apt to appear, and it is a useful and reliable sign both that there will be little or no subsequent hypertension or albuminuria and that premature induction of labour will be unnecessary. Its absence indicates probable trouble ahead.

Some of the mothers who have œdema of the fingers, mild hypertension, and a little albuminuria also show slowing of the weight increase, but it is less well-marked. In those mothers who develop severe hypertension and gross albuminuria it is usual to find acceleration rather than slowing, the weight continuing to increase by 2 or 3 lb. each week.

Eclampsia and Sex of Fœtus

Both œdema of the fingers and eclampsia are preceded by heavy or excessive gains of weight. Eclampsia is preceded by œdema of the fingers, and this (as has been shown) may be related to the sex of the fœtus, its incidence being highest in male-bearing primiparæ. Is eclampsia itself related to the sex of the fœtus?

Unexpectedly this question could not be answered by reference to maternity-hospital reports, because they do not record the sex of babies born to eclamptic mothers. Seemingly this information has been considered unimportant or irrelevant. It therefore became necessary to arrange special searches through the case-records of various hospitals. Figures were obtained, either for five-year or ten-year periods, from different areas in England, Scotland, and Ireland. In Reading the records were of known cases of eclampsia among our own patients and cases at Battle Hospital (1948–53). From Oxford at the Radcliffe Infirmary (1942–52); from London at Queen Charlotte's Hospital (1941–51), University College Hospital (1941–51), and Edgware Hospital (1942–52); from Sheffield at the Jessop Hospital (1947–51); from Edinburgh at the Simpson Memorial Pavilion (1948–52); and from Dublin at the Rotunda (1942–52).

The number of cases of eclampsia in which the sex of the fœtus was ascertained was 402; 294 of the mothers were primiparæ who had borne 315 babies, and 108 multiparæ who had borne 118 babies. There were no triplets and the incidence of twins was high (see table I).

TABLE I—402 CASES OF ECLAMPSIA

—	Primigravidæ			Multiparæ		
	No. of mothers	No. of babies		No. of mothers	No. of babies	
		Male	Female		Male	Female
General practice ..	9	7	4	2	..	2
Battle Hospital ..	19	13	6	6	5	1
Radcliffe Infirmary	18	9	9	14	8	7
Queen Charlotte's Hospital	43	29	18	4	1	5
University College Hospital	18	16	3	2	1	1
Edgware Hospital..	31	11	21	9	5	4
Jessop (Sheffield) ..	40	22	22	17	10	10
Simpson (Edinburgh)	62	39	24	21	13	12
Rotunda (Dublin)..	54	32	30	33	10	23
Total ..	294	178	137	108	53	65

In the population it is usual for 105 boys to be born for every 100 girls (De Lee and Greenhill 1943)—i.e., 5% more boys than girls. In the present series, of 433 babies born to eclamptic mothers 231 were boys and 202 girls—i.e., 14·4% more boys—and of 315 babies born to primiparous eclamptics 178 were boys and 137 girls—i.e., 29·9% more boys. On the other hand, of 118 babies born to multiparous eclamptics 53 were boys and 65 girls—22·6% more girls. If, however, the figures for the Rotunda multiparæ are excluded, the sexes are nearly equal—43 boys and 42 girls. Investigation showed that the Rotunda multiparæ were of unusually high parity: 15 were for the 4th–6th time and 10 for the 7th–13th time; they were clearly much older mothers than the more male-producing primiparæ.

Effect of Maternal Age

Apart altogether from the fact that the relatively old Dublin eclamptics bore more girls than boys, two other observations attracted my attention to the age of the mothers: (1) the primiparæ with œdema of the fingers had borne more boys than girls, much more noticeably when the mothers were in the early twenties than when they were over thirty; and (2) Hamlin's (1952) statement that grave rapidly progressive pre-eclampsia occurs almost exclusively in primiparæ aged 23 years or less.

In 12 cases the age of the eclamptic mother was unknown, but the remaining 421 babies were divided into four groups according to whether their mothers were primiparæ or multiparæ and under or over thirty:

	30 years or less		*Over 30 years*	
	Boys	*Girls*	*Boys*	*Girls*
Primiparæ	150	98	21	38
Multiparæ	20	19	31	44

Of 248 babies (150 boys, 98 girls) born to primiparous eclamptics aged less than 30, there were 53·1% more boys than girls. Of 39 babies (20 boys, 19 girls) born to multiparous eclamptics aged less than thirty there were 5·0% more boys than girls.

By way of contrast, of 59 babies (21 boys, 38 girls) born to primiparæ aged more than thirty there were 80·9% more girls than boys, and of 75 babies (31 boys, 44 girls) born to multiparæ aged more than thirty there were 41·9% more girls than boys. The primiparous and multiparous eclamptics aged more than thirty therefore bore 134 babies, of whom there were 57·7% more girls than boys.

Discussion

The normal sex-ratio of babies is 105 boys to 100 girls or 51·2% male. This male majority increases with prematurity (Greulich 1921), and is possibly due, like prematurity, to toxæmia.

Of the babies borne by the eclamptic mothers, Prof. Bradford Hill decided that two groups were statistically significant: the 248 babies of primiparæ under 30 (60·5% male = +9·3), and the 59 babies of primiparæ over 30 (35·6% male = −15·6). These provide strong evidence that both maternal age and the sex of the fœtus are concerned in causing eclampsia. This conclusion is supported by the other groups, whose numbers, however, are too few to be significant.

How, then, can one explain why eclampsia can arise with a sexless hydatidiform mole? The following explanation is offered.

Transplacental Hormones

Eclampsia is the result of resistance by a mother to the entry of transplacental hormones produced by a fœtus or a mole. Antibody formation in rhesus-negative mothers shows that mothers may react to fœtal products. Whereas entry of fœtal blood into the mother is abnormal, entry of fœtal hormones is not. The incidence of eclampsia increases pari passu with the strength of invading hormones; hence eclampsia is very rare when the concentration of fœtal (but not vesicular) hormones is weak—i.e., in the first half of pregnancy—but it becomes progressively commoner as the growing baby produces more hormones, and it is commoner still with the double amount of hormones produced by twins.

The relation between the sex of the fœtus and eclampsia suggests that the mother is intolerant of fœtal sex-hormones. The intolerance appears greatest, among young primiparæ, towards the male hormone, since they bear more boys than girls; but the opposite findings in older eclamptics, who bore more girls than boys, suggest that the initially high intolerance to the male hormone declines with advancing age, while intolerance to the female hormone is stationary.

Rapidly progressive pre-eclampsia, according to Hamlin (1952), affects only young primiparæ—i.e., those likely to bear more boys than girls—and I have not yet heard of fulminating eclampsia accompanying the birth of a girl. Moreover those primiparæ who, at Edgware Hospital, bore more girls than boys were unusually old—over half (16 of 31) were 29 or older, and 9 who were over 34 bore 7 girls but only 2 boys.

TABLE II—AVERAGE MONTHLY WEIGHT INCREASE IN 1000 PREGNANT WOMEN (Cummings 1937)

Month	1	2	3	4	5	6	7	8	9
Gain (lb.).. ..	—	1	1	4	4	5	5	3	3

Stimulation by Invading Hormones

A sustained acceleration of weight increase, beginning in the 4th month, occurs normally in pregnancy (table II) but is more pronounced in women who overeat and develop toxæmia or eclampsia. I believe that invading fœtal hormones are responsible for the acceleration, particularly fœtal insulin, whose aid is thought to explain the reduced insulin requirement of diabetic mothers during the second half of pregnancy (Brown 1944). They stimulate the mother to store, instead of burn up, her surplus calories. To prevent (in those who overeat) large gains of weight, Nature, after a period of tolerance, resists the entry of further hormones.

Resistance to Hormones

By subtracting the weight gained by the average fœtus from the weight increase of the average mother (table II) one finds that the mother gains 8 lb. (10 −2) in the 6th and 7th months, and 2 lb. (6 −4) in the 8th and 9th months; her gain is reduced by three-quarters, thus neutralising the fourfold acceleration observed in the 4th month. This slowing, I believe, denotes resistance to the cause of the acceleration—i.e., to the hormones. (Resistance to another hormone from an external source is illustrated by the failure, after a few months of success, of administered thyroid gland to cause loss of weight.) When there is either œdema or hydramnios, the slowing of weight increase is obscured by retention of fluid, but resistance to the hormones is still acquired.

Parity and Resistance to Invading Hormones

Some resistance to the hormones, which is acquired at the first pregnancy, is retained, usually increasing maternal tolerance to their presence and action, and making eclampsia less likely in subsequent pregnancies. But sometimes intolerance persists and recurrent toxæmia results.

Effects of Maternal Resistance to Entry of Hormones

The maternal reaction, resisting the entry of hormones, damages the syncytium and villi, sometimes causing hæmorrhage or infarcts. It impedes nutrition of the fœtus and often kills it; and it may interfere with the production and absorption of liquor amnii, causing hydramnios, or interfere with the production of placental hormones, leading to a fall in blood-œstrin and urinary pregnanediol (Smith and Smith 1935). Owing to this, possibly, premature labour is common.

When damaged, the syncytium produces toxin which causes œdema, toxæmia, and eclampsia if pumped into the maternal circulation by fœtal heart-beats or by uterine contractions. The ejection of toxin by contractions explains both the frequent appearance of albuminuria during labour and the reappearance during labour of eclampsia some days after improvement has followed death of the fœtus.

For the first day or two of the puerperium, until the organs have had time to recover from the last intensified (through contractions) exposure to toxin, eclampsia remains a diminishing danger.

The mother's tolerance to the invading hormones varies with her diet. The more she eats the more rapidly does her weight increase, the greater is her need to resist the entry of the hormones, the stronger is her reaction, the greater is the disturbance in the placenta, the greater are the danger to the baby and the damage to the syncytium, and the greater are the resulting production of toxin and the likelihood of toxæmia and eclampsia. Overeating encourages eclampsia, and the supposed effects of climate and season are probably due to diet; overeating is more common in cold climates and cold seasons, as also is eclampsia. Moreover there is a higher incidence in certain carbohydrate-consuming communities—e.g., Dublin with popular potatoes—in whom the diet encourages heavy gains of weight.

Maternal Resistance to Syncytial Toxin

The danger of eclampsia and recurrent toxæmia is increased by factors reducing resistance to the toxin. Such factors are defects of diet (inadequate vitamins, protein, and calcium), excessive sodium, inherited tendencies to obesity and fits (Rosenbaum and Maltby 1943), and certain diseases—e.g., beriberi, essential hypertension, and chronic nephritis. A feature common to these factors is their tendency to encourage signs of developing eclampsia—excessive weight, œdema, hypertension, albuminuria, and fits.

Suggestions for Confirmatory Tests

If the entry of fœtal hormones is resisted, there should be, in toxæmia, less of the hormones in the mother. Thus little or no fœtal insulin would, during toxæmia, be entering to assist a diabetic mother; and, although she would need less insulin in mid-pregnancy (to avoid a heavy gain in weight) and until term in the absence of toxæmia, she would require more insulin, if she became toxæmic, to compensate for the lack of fœtal insulin and to prevent ketosis. With the double danger of toxæmia and ketosis, one would expect (and one finds) a high fœtal mortality with diabetes.

Blood-sugar estimations may confirm these suggestions concerning the thorny problems of diabetes and toxæmia.

It is claimed that a certain substance, appearing in the saliva, indicates a male fœtus (Rapp and Richardson 1952). If this substance is related to the sex-hormones of the fœtus, one can explain both the success and the failure of those who have tried using it to predetermine sex. The accuracy claimed by Rapp and Richardson (1952) has not been reported by other workers, but the former were looking for it in the 6th and 7th months (i.e., before the onset of toxæmia) whereas others may well have searched either later or among hospital inpatients and outpatients (i.e., when toxæmia is common). If the amount of fœtal hormones in the maternal blood is reduced, the related androgenic substance would probably disappear from the saliva. Tests on the saliva, before and after the onset of toxæmia, may clarify this matter, and may confirm the theory of eclampsia that I put forward.

Conclusion

Do transplacental hormones cause eclampsia? Apparently, yes. The mother at first responds to their stimulation but later resists their entry, her resistance varying with the carbohydrate content of her diet. The placenta, damaged by her resistance, produces toxin which, when pumped into the mother by the fœtal heart-beats or by the uterine contractions, gives rise to toxæmia and eclampsia. Dietetic deficiencies and certain diseases render the mother more vulnerable to the toxin. Fœtal, maternal, placental, and dietetic factors are concerned in producing eclampsia, but fundamentally transplacental hormones from a boy, a girl, twins, triplets, or a hydatidiform mole cause eclampsia.

Summary

The verbal evidence of 1000 mothers suggested that œdema of the fingers was more common in primiparæ than in multiparæ, and in primiparæ who had borne boys than in those who had borne girls.

This apparent connection between œdema of the fingers and the sex of the fœtus was confirmed from the antenatal records of 502 patients. The incidence of œdema of the fingers in primigravidæ was 43·7% and in multiparæ 20·7%; but, whereas it was 52·7% in primiparæ who bore boys, it was only 33·3% in primiparæ who bore girls. In multiparæ who bore boys it was 21·4%, and in multiparæ who bore girls 20·1%.

Œdema of the fingers is usually preceded by large gains of weight and appears shortly after pedal œdema, but it is sometimes found without the latter.

The rate of weight increase is slower in the last two months than in mid-pregnancy, provided there is no œdema, but with œdema rapid increase continues till term. Slowed weight increase in the eighth month means no subsequent toxæmia.

There was statistically significant evidence of a relationship between the sex of the fœtus, maternal age, and eclampsia in two groups among 433 babies born to 402 mothers with eclampsia: primiparæ under thirty bore 248 babies of whom 60·5% were males (9·3% more than the expected percentage) and primiparæ over thirty bore 59 babies of whom 35·6% were males (15·6% less than the expected percentage). Other groups also showed variations of fœtal sex-ratio, but their numbers are too few for the results to be significant.

It is suggested that hormones from the fœtus produce variations in the maternal weight, and that the occurrence of eclampsia is controlled by: (1) maternal resistance to the action of the invading hormones; (2) her resistance to the entry of the hormones (from the uterus); and (3) her resistance to the toxin produced by the second resistance. The first resistance towards the male sex-hormone is acquired by parity, weakened by an excessive carbohydrate diet, and increased by advancing age. The second resistance depends on the adequacy or inadequacy of the first, and the third is weakened by dietetic defects and certain diseases.

The three resistances are interdependent but all arise in response to the invasion by the basic cause of eclampsia—i.e., transplacental hormones from a fœtus or a hydatidiform mole.

Two investigations are suggested for confirming the correctness of this theory.

I wish to thank Prof. J. Chassar Moir for criticism, advice, and the records from the Radcliffe Infirmary; Mr. F. E. Wheeler, Miss A. Johns, and Miss M. M. Harvey for the Battle Hospital records; Prof. W. C. W. Nixon and Dr. D. Pells Cocks for those of University College Hospital; Mr. G. F. Gibberd for those of Queen Charlotte's Hospital; Mr. E. ap. I. Rosser and Miss H. Ridge for those of Edgware General Hospital; Prof. C. Scott Russell for those from Sheffield; Dr. Clifford Kennedy and Dr. T. L. Adamson for those from Edinburgh; Dr. E. W. L. Thompson and Miss M. E. M. Aherne for those from the Rotunda; Dr. H. S. Le Marquand and Dr. F. O. MacCallum for advice and help; and Prof. A. Bradford Hill for advice about the statistical significance of the findings.

REFERENCES

Brown, F. J. (1944) Antenatal and Postnatal Care. 5th ed., London; p. 471.
Cummings, H. H. (1937) *Amer. J. Obstet. Gynec.* **27**, 808.
De Lee, J. B., Greenhill, J. P. (1943) Principles and Practice of Obstetrics. 8th ed., Philadelphia; p. 51.
Greulich, H. (1921) *Science*, **2**, 53.
Hamlin, R. H. J. (1952) *Lancet*, **i**, 64.
Ministry of Health (1950) Report for the Year ended 31st March, 1950. Part II, p. 99.
Rapp, G. W., Richardson, G. C. (1952) *Science*, **115**, 265.
Rosenbaum, M., Maltby, G. L. (1943) *Arch. Neurol. Psychiat., Chicago*, **49**, 204.
Smith, G. V., Smith, O. W. (1935) *Surg. Gynec. Obstet.* **61**, 27.

MONILIAL (CANDIDA) ENDOCARDITIS
FOLLOWING TREATMENT WITH ANTIBIOTICS

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ENDOCARDITIS due to fungi is rare. It is described by American authors, including Zimmerman (1950) and Geiger et al. (1945–46), but does not seem to have been recorded in this country.

Case-report

A married man, a park-keeper, aged 43, was admitted to New End Hospital, Hampstead, on Aug. 21, 1954, with a perforated duodenal ulcer. This was repaired the same day and convalescence was uneventful. A history extending over fourteen years with two episodes of perforation made further surgical treatment advisable. At operation by Mr. D. B. Caro on Sept. 21, 1954, a chronic ulcer was found in the anterior wall of the first part of the duodenum adherent to the liver, and an antecolic Polya partial gastrectomy was performed.

The postoperative course was stormy, including transient jaundice, paralytic ileus with severe disturbance of biochemical balance, and bronchopneumonia. Treatment included intravenous fluids and electrolytes, penicillin, chlortetracycline (aureomycin), and streptomycin, with vitamin supplements. When discharged on Dec. 22 he was gaining weight, eating well, and having no pain. Between August and December he had had large doses of antibiotics (crystalline penicillin, 30 mega-units, streptomycin 27 g., and chlortetracycline 6 g.).

He was again in hospital in March for investigation of abdominal pain. This was controlled by decreasing the size, and increasing the frequency of his meals. He was afebrile during this period.

On April 19 he was readmitted because of the sudden onset of severe pains and numbness in the left leg. For some weeks he had had symptoms of intermittent claudication. Temperature 100°F; pulse was regular and rate 110 per min. No arterial pulses were palpable in the left groin and in the peripheral arteries of the left limb. Blood-pressure 125/85 mm. Hg. The heart sounds were closed, and there was a soft systolic murmur at the apex. The urine contained numerous red blood-cells.

He was treated with anticoagulants. His symptoms improved and weak pulses returned to the limb, but on May 6 he showed signs of occlusion of the right external iliac artery, and on May 15 he developed a left hemiplegia. He died the next day.

Necropsy

A thin, prematurely aged man with multiple petechiæ over limbs and trunk. *Heart:* weight 395 g. Pericardium normal. Moderate hypertrophy of the myocardium of the left auricle and ventricle. Stenosis of mitral valve with fibrous thickening of the cusps, and shortening and fibrosis of the chordæ tendinæ. There was a mass of polypoid vegetations 1·5 × 2·5 × 1 cm. on the auricular aspect of the anterior cusp of the mitral valve. The other valves were normal. *Arteries:* severe atheroma of the aorta and its main branches with many calcified plaques. Fibrinous masses looking like the vegetation on the mitral valve occluded both external iliac arteries. *Lungs:* purulent bronchitis and bronchopneumonia at the bases. *Brain:* recent softening 2 cm. in diameter in the right parieto-occipital region. Fatty *liver*. Chronic septic *spleen*. "Flea-bitten" *kidneys*.

Histology

Mitral valve.—Subacute fibrino-purulent vegetation containing profuse, non-branching, septate, spore-producing fungus on a fibrotic (chronic rheumatic) valve cusp (figs. 1 and 2). *Arteries:* ante-mortem (organising) embolic thrombi in left and right external iliac arteries both containing similar fungus (fig. 3). *Brain:* recent hæmorrhagic, purulent softening. *Kidneys:* focal embolic inflammation.

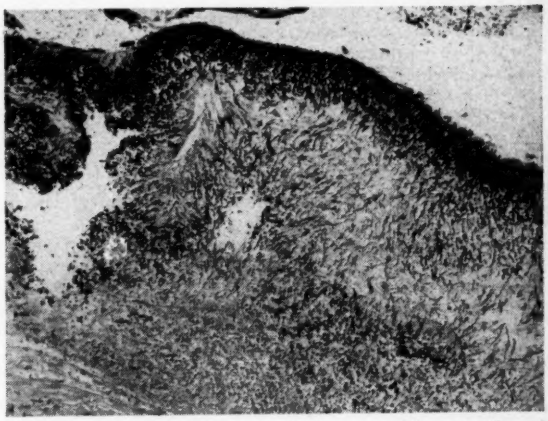

Fig. 1—Fungi in vegetation on mitral-valve cusp. (Hæmatoxylin and eosin. × 60.)

Comment

Identification of the fungus.—As the fungus was not cultured, its identification can only be presumptive.

Heavy inocula of the material should be made with Sabouraud's dextrose agar, Littman's medium (Littman 1948), or penicillin-streptomycin blood-agar if bacterial contamination is likely (Riddell 1951).

At least five different genera of fungi may at times be confused with one another. These are candida (monilia),

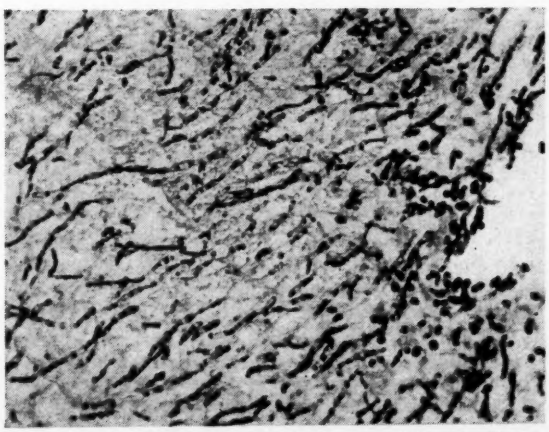

Fig. 2—Fungi in vegetation on mitral-valve cusp. (Hæmatoxylin and eosin. × 285.)

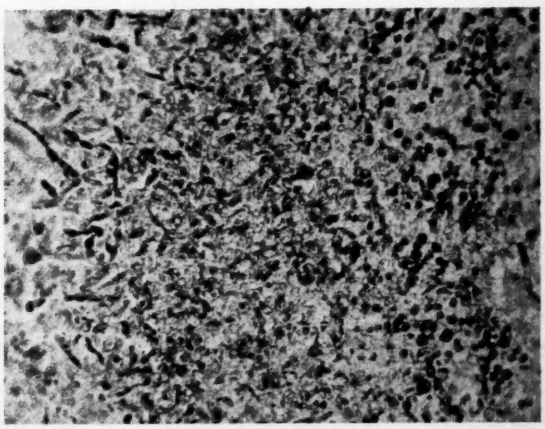

Fig. 3—Fungi in clot from left external iliac artery. (Hæmatoxylin and eosin. × 60.)

aspergillus, mucor, cryptococcus, (torula), and histoplasma (Zimmerman 1950). *Cryptococcus neoformans* and *Histoplasma capsulatum* may be excluded if mycelial structures are seen (Baker 1945). Mucor may be readily distinguished from candida and aspergillus by its characteristic mycelium (Gregory et al. 1943); lateral branching is prominent, and the hyphæ, which are non-septate, show considerable irregularity of width due to areas of swelling and constriction. It is more difficult to differentiate candida from aspergillus, for both have septate hyphæ; but the hyphæ of aspergillus are larger than those of candida and show more lateral branching. Spore forms are usually not seen in tissue aspergillosis (Zimmerman 1950).

Chemotherapy.—There is much laboratory and clinical evidence suggesting that chemotherapy encourages the spread of candida and other mycotic infections in the human body. Foley and Winter (1949) found that a single injection of penicillin on the chorio-allantoic membrane of ten-day-old chick-embryos increased the mortality-rate resulting from *Candida albicans* infection, and several authors (Moore 1951, Pappenfort and Schnall 1951, Huppert et al. 1953) have shown that chlortetracycline exerts a direct stimulation to the growth of *C. albicans* in Sabouraud's broth and agar.

C. albicans is present in the gastro-intestinal tract of many normal people. Sharp (1954) reported the frequency of this organism in throat swabs, sputum, and rectal swabs before and after treatment with oxytetracycline (terramycin). After a five-day course (mean total dose 14·2 g.), the proportion of specimens with candida in throat swabs rose from 16 to 42%, in the sputum from 32 to 61%, and in rectal swabs from nil to 59%.

Monilial vaginitis has been described following chlortetracycline therapy (Harris 1950); oral and intestinal lesions following penicillin, chlortetracycline, and chloramphenicol (Woods et al. 1951), and following sulphadiazine (Beemer et al. 1954). Reynell et al. (1953) reported general peritonitis caused by *C. albicans* following perforation of chronic duodenal ulcer in a patient receiving chlortetracycline and oxytetracycline, and cases of monilia pneumonia (Ormerod and Friedmann 1951, Wolff 1952) and moniliasis of the urinary tract (Taylor and Rundle 1952) have been reported in patients treated with chlortetracycline or chloramphenicol. Zimmerman (1950) quotes Dr. S. Farber's experience at the Children's Hospital, Boston, where disseminated moniliasis occurred in seven children who were being treated with various chemotherapeutic drugs (mostly penicillin and chlortetracycline) for other diseases. No similar cases were seen prior to 1946.

On the other hand, Kligman (1952) reported no adverse influence of antibiotics on the course of experimental moniliasis in mice, and he believes that *C. albicans* cannot cause disease except in the presence of some debilitating illness. McGovern et al. (1953) investigated the incidence of *C. albicans* in the gastro-intestinal tracts of normal children before and after treatment with chlortetracycline and chloramphenicol. They concluded that the danger of moniliasis arising from their use is small, provided relatively short courses are given. Our patient and most of the patients mentioned above received protracted courses of antibiotics.

Summary

A case of infective endocarditis in a man aged 43 due to an organism morphologically indistinguishable from *Candida albicans* is reported. There is strong evidence that protracted courses of chemotherapy may encourage the production of systemic moniliasis, and unless these causes can be curtailed, there is a danger that the incidence of this serious disease may increase.

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REFERENCES

Baker, R. C. (1945) *Sth med. J.* **38**, 272.
Beemer, A. M., Pryce, D. M., Riddell, R. W. (1954) *J. Path. Bact.* **68**, 359.
Foley, J. E., Winter, W. D. (1949) *J. infect. Dis.* **85**, 26.
Geiger, A. J., Wenner, H. A., Axilrod, H. D., Durlacher, S. H. (1945–46) *Yale J. Biol. Med.* **18**, 259.
Gregory, J. E., Golden, A., Haymaker, W. (1943) *Bull. Johns Hopk. Hosp.* **73**, 405.
Harris, H. J. (1950) *J. Amer. med. Ass.* **142**, 161.
Huppert, M., MacPherson, D. A., Cazin, J. (1953) *J. Bact.* **65**, 171.
Kligman, A. M. (1952) *J. Amer. med. Ass.* **149**, 979.
Littman, M. C. (1948) *Amer. J. clin. Path.* **18**, 409.
McGovern, J. J., Parrot, R. H., Emmons, C. W., Ross, S., Burke, F. G., Rice, E. C. (1953) *New Engl. J. Med.* **248**, 397.
Moore, M. (1951) *J. Lab. clin. Med.* **37**, 703.
Ormerod, F. C., Friedmann, I. (1951) *Brit. med. J.* ii, 1439.
Pappenfort, R. B., Schnall, E. S. (1951) *Arch. intern. Med.* **88**, 729.
Reynell, P. C., Martin, E. A., Beard, A. W. (1953) *Brit. med. J.* i, 919.
Riddell, R. W. (1951) Recent Advances in Clinical Pathology. London; p. 95.
Sharp, J. L. (1954) *Lancet*, i, 390.
Taylor, H., Rundle, J. A. (1952) *Ibid*, i, 1236.
Wolff, F. W. (1952) *Ibid.*
Woods, J. W., Manning, J. H. jun., Patterson, C. N. (1951) *J. Amer. med. Ass.* **145**, 207.
Zimmerman, L. (1950) *Arch. Path.* (*Lab. Med.*) **50**, 591.

Medical Societies

BRITISH ORTHOPÆDIC ASSOCIATION

THE association's autumn meeting was held in Liverpool on Oct. 6–8, under the presidency of Prof. BRYAN MCFARLAND. On Oct. 8 the new president, Mr. PHILIP WILES, took the chair.

Was Lucas-Championnière Right?

Prof. GEORGE PERKINS (London) proposed the motion that Championnière was right. Lucas-Championnière, he said, had written a book on fractures, the basic theme of which might be summarised as "to hell with splints." While Professor Perkins could not support this in toto Lucas-Championnière was certainly more right than wrong. Splintage caused stiffness and this did *not* always disappear with time. Stiffness resulted from (1) inextensibility of muscle; (2) incongruity of joint surfaces; and (3) organisation of exudate. If a muscle was held in the shortened position it lost its ability to extend and muscle tone was inhibited. The only way to prevent this loss of extensibility was to stretch it occasionally to the full, but splintage made this impossible. With regard to the joint surface, it was impossible to produce perfect reduction of most fractures into joints, but early movement moulded the joint surfaces and reproduced congruity. At the same time avoidance of splintage prevented the muscles binding together from the organisation of hæmatoma and exudate.

Splintage was of two types; the *pure*, which was prolonged, uninterrupted, rigid, and extensive; and the *simple*, which was none of these things and was simply used to maintain reduction where displacement would otherwise recur. The "splinters," Professor Perkins said, held the tenet that because a few need it, all need it. Only three fractures needed pure splinting—the neck of the femur, the carpal scaphoid, and the mid-shaft of the radius, the latter because no other method would control rotation strain. Hinging movements and rotation were the causes of fibrous union, because they stretched the early callus; and the philosophy of the "non-splinters" lay in their faith that with few exceptions muscles alone would prevent this stretching. There was no need to set a fracture if there was no displacement, if the displacement did not matter, or if reduction was impossible. Finally, he proposed that the non-splinters' creed should be: (1) don't burden the patient with purposeless splints; (2) a "simple" splint does less harm than a "pure" splint; (3) only a few fractures need "pure" splintage; and (4) reduce the use of "simple" splintage to the minimum.

Sir REGINALD WATSON-JONES (London), opposing the motion, said that in Lucas-Championnière's era (1843–1913) splintage was very complete and extensive, and he had not known that it was possible to hold bone still and yet continue to use the overlying muscles. He had said that perfect reduc-

tion was neither possible nor desirable and had advocated massage and mobilisation of *all* fractures. Sir Reginald could not accept Professor Perkins's differentiation of splintage; if one fracture needed immobilisation, they all needed it. He believed that if a fracture was to unite with certainty it must be immobilised completely, and all fractures would unite if they were immobilised for long enough. Non-union resulted from splintage that was physiologically not complete enough, or not maintained for long enough. We should not fear the *temporary* resultant stiffness; if functional activity was maintained, there was rapid recovery of a full range of movement. The immobilised knee or shoulder always recovered its movements if reliance was placed on active exercises alone. Many new hip operations were based on the fundamental, but in Sir Reginald's view unfounded, fear of permanent knee stiffness if this joint were immobilised; but, in 200 cases of hip arthrodesis with the limb in plaster for many months, less than 8% had stiff knees. All the fears of Lucas-Championnière would have been put at rest had he had our knowledge of the need for maintaining muscle activity in a splinted limb.

Mr. NORMAN ROBERTS (Liverpool), seconding the motion, maintained that what Lucas-Championnière had really said was that the immobilisation of fractures as practised in his day gave pride of place to union and disregarded function; the resultant withered limbs were worse than the results of no treatment at all. Böhler and Watson-Jones had recognised the dangers and assured us that with their methods of treatment the danger was over; the trouble was that we had believed them! Mr. Roberts believed that immobilisation was losing ground year by year. There were only two indications for splintage; to make a fracture unite which would not otherwise do so, and to keep a fracture in good position. He spoke of the perils of internal splintage and said that nothing but good could follow the abandonment of unnecessary splintage, especially in joint fractures. According to Mr. Roberts, who demonstrated his possession of the book, or at least a book, by Lucas-Championnière, the latter had *not* said that his method was applicable to *all* fractures—he certainly immobilised some fractures of the tibia and fibula.

Mr. ROBERT ROAF (Oswestry), seconding the opposition, advised the meeting to leave the realms of fantasy and get back to reality. He then played a long recording of quotations from Lucas-Championnière, which the president translated as "Massage is a good thing." Mr. Roaf maintained that Mr. Roberts was in reality an exponent of perfect reduction and fixation and he was therefore quite unable to believe what he had just said. Lucas-Championnière was an arrogant writer but no true scientist, a believer in "all or nothing," a surgical Karl Marx. Innovations must have a scientific basis; even now we had no fixed concept as to what constituted union and when, but Lucas-Championnière maintained that massage and passive movement reduced the fracture and promoted union—a statement for which he produced no evidence whatever. He looked backwards to the mysticism of the Middle Ages, and he lacked the true artist's "feel" for his material. "In science dogmatism is always wrong." The principle of reducing a fracture and holding it reduced remained a sound one. John Hunter had demonstrated the close connection between form and function, but Lucas-Championnière believed in neither. To vote for Lucas-Championnière, he concluded, was to vote against Hunter.

In the discussion, Mr. PHILIP WILES (London) said that the conflict was as old as surgery itself; the bone needed rest, the soft parts needed mobilisation. The advocates of the conflicting beliefs might be compared to fascists who regimented everything and anarchists who preferred a free for all. In reality right lay between the two. He remarked on the benefits to be expected from the use of hyalase in reducing the binding in soft parts, and said he would prefer to vote for a centre party which made use of the best in both creeds.

Mr. G. FISK (London) supported the motion. The physiological immobilisation of Watson-Jones was in reality physiological mobility. The contractile effect of the muscle tube gave the earliest recovery of function, and he had had only 1 case of delayed union (due to muscle interposition) in 120 cases of fractured femur treated by early movements.

Mr. JOHN CHARNLEY (Manchester) thought that a middle course, as advocated by Mr. Wiles, was dangerous. The motion was either right or wrong; he felt that massage was the real basis of Lucas-Championnière's theme. There were three possible causes of failure to unite: (1) the callus never crossed the gap; (2) the callus succeeded in crossing the gap, but was too fragile, broke down, and reverted to (1); and (3) the callus would cross the gap successfully if only it were immobile. If a bone were plated, only (1) could be relevant because immobility was far greater than could be achieved by any other method. He had ventured a "law of conservative treatment": full mobility could be restored if all bones and joints in a limb were fixed no longer than the physiological maximum of eight weeks. If union were delayed and longer fixation were required, joint stiffness would follow. But prolonged splintage alone was not the cause; there was some other factor.

Mr. F. G. ST. C. STRANGE (Canterbury) said that in Nature immobilisation of a fracture was unknown—it was a wonder to him that an immobilised fracture united at all. The principles of reduction, maintenance of reduction, and restoration of function were out of proportion. We should take a lesson from Nature. He believed that all fractures would unite if *not* immobilised, except those where there was interference with the local blood-supply. Mr. H. OSMOND-CLARKE (London) remarked that, in spite of this, veterinary surgeons shoot race-horses with broken legs.

Mr. W. SAYLE-CREER (Manchester) replied that this was merely because it was uneconomic to treat the horse. He found the debate confusing because the terms of reference were too loose. Quoting the instance of the fractured os calcis, he said that no treatment was only modified treatment. The failures in fractures were due to over-treatment.

Mr. M. ALMS (Liverpool) discussed the importance of the patient's state of mind. The hunger stimulus forced the injured animal into activity; there was no such stimulus under the Welfare State. 90% of children needed no treatment for their fractures; they were still at the animal stage. The madman with no sense of pain and the tough keen extrovert both did well. He felt that both the opening speakers were right; they had sold themselves to their patients by virtue of their enthusiasm.

Prof. WALTER MERCER (Edinburgh) called attention to a patient whose ankle and knee were immobilised for two years while an arthrodesis of the knee proceeded to fusion. At the end of this period the ankle was completely stiff, but within two months had regained normal mobility.

Professor PERKINS, summing up, remarked that the Pyrford hip arthrodesis was designed with the object of putting the hip at rest, not of leaving the knee free. Lucas-Championnière should be accepted as no more than a great figure in medicine and a pioneer of physiotherapy.

Sir REGINALD WATSON-JONES said that non-union and mal-union *do* matter. He agreed that immobilisation was bad for the soft tissues, but reiterated that he kept the soft parts moving.

The motion that Lucas-Championnière was right was defeated by 94 votes to 73.

Recurrent Dislocation of the Shoulder

Mr. J. W. DICKSON and Mr. M. B. DEVAS (London) had reviewed recurrent dislocation of the shoulder with special reference to the late results of Bankart's operation. Bankart had left no detailed follow-up; they had collected 50 cases done by Bankart himself or strictly according to his technique, with special reference to the presence of the lesion he described, the range of movement after operation, and the recurrence-rate. The initial trauma followed no set pattern, and they had found no association between the side of the dislocation and hand-dominance. The classical lesion was present in 32, absent in 9, and indefinite in 9. 50% had less than 10° loss of external rotation range; 7 cases had more than 60° loss of external rotation, but in only 3 of these was it directly attributable to the Bankart operation itself. Recurrence of the dislocation occurred in 2 cases, but in each instance was due to severe trauma; neither had a defect in the humeral head. They concluded that the operation was very effective with no significant resultant loss of movement. They showed a film of a thirty-year result in the 7th case on which Bankart had operated.

Mr. OSMOND-CLARKE said that only two operations regularly enabled a man in the Services to return to A1—the Bankart and the Putti-Platt. He felt that a substantial majority had a defect in the humeral head, and any operation that permitted this area to come into contact with the glenoid was liable to produce a "cog-action." In a series of over 100 cases, he had

had only 2 recurrences, both readily explicable. Loss of external rotation gave rise to no disability. He advised the use of either operation, but the boring of the necessary holes in the glenoid margin in the Bankart operation was difficult.

Displacement Osteotomy for Hip-joint Disorders

Mr. D. WAINWRIGHT (Stoke-on-Trent) had reviewed 69 cases of displacement osteotomy in the treatment of disorders of the hip-joint; 4 for old congenital dislocation, 4 for congenital coxa vara, 3 for slipped epiphysis, 7 for fractures of the femoral neck, 3 for old septic arthritis, 22 for tuberculous coxitis, and 26 for osteo-arthritis. In the fractures there was a fair chance of producing union if the operation was done early enough. In the tuberculous cases 10 out of 11 with fibrous ankylosis proceeded to bony fusion. Of 11 with active disease, 7 fused by bone. In the osteo-arthritic cases relief of pain was almost constant, and improvement in the joint itself might continue as long as fifteen years. 5 of these, all very severe and stiff before operation, proceeded to bony ankylosis. Even with inadequate displacement, results were often very good, and Mr. Wainwright wondered why this was so and whether the displacement was really necessary. He thought that the provision of a pelvic *point d'appui* was not vital, but that the operation worked by correcting deformity and correcting the lines of stress. It was possible that the mere division of the bone produced some beneficial vascular change. He paid tribute to T. P. McMurray and reminded the audience that in his hands the operation used to take five minutes and involved the use of a knife, an osteotome, a pair of forceps, and three short pieces of silk.

Prof. J. TRUETA (Oxford) discussed the reasons for the apparent thickening of the joint cartilage which followed the operation. The changed mechanics might allow some regeneration. Pauwels said it was the varus which helped, but McMurray had said it was the valgus. In reality it was probably the freeing of the femoral head, so that one was making use of an unworn area of cartilage in the new region of stress. He had noted that patients with the best results walked in slight flexion, and he thought that the results in the tuberculous cases confirmed that an increased blood-supply was an important factor.

Professor MCFARLAND said that if the operation was done under local anæsthesia it was apparent that division of the bone itself did cause pain.

Mr. K. I. NISSEN (London) thought that the answer lay in Trueta's work, whence it appeared that pain was related to hyperæmia and that it was the diminution of blood-supply that was beneficial. Eventually it might prove unnecessary to divide the bone completely; some minor local intervention might be equally successful.

Volkmann's Contracture

Mr. H. J. SEDDON (London) said that his personal experience of Volkmann's contracture was extensive only because cases had been sent to him from all over the country, in many of which ischæmia had apparently been inevitable. In the forearm there was an ellipsoid zone of ischæmia, worst at its centre. The deep forearm flexors were also involved, and the median nerve passed through the centre of the zone. Flexor digitorum profundus and flexor pollicis longus were the most affected. He divided cases into three grades: those where the changes were reversible, those leading to some fibrosis, and those with severe fibrosis and necrosis. The nerve lesion might also be recoverable if there had been no more than Wallerian degeneration distally, but usually there was a length of thin dirty-yellow nerve through which axons could never pass. He advised that after a delay of three months the complete infarct, which acted as a foreign body and stimulated fibrosis, should be excised, thus converting the forearm into a condition comparable to that after a severe injury: operation was *not* always required. For repair, various tendon transplants were feasible, and nerve-grafting or repair by nerve pedicle was usually required to bridge the large gap. He thought it better to complete the tendon operations before undertaking repair of the nerve for fear that the former, if done subsequently, might interfere with the recovery of the nerve-graft. Assessment of the need for a nerve-graft was helped by biopsy at three different levels if there was doubt; a graft was certainly required if the nerve narrowed to less than one third of its normal diameter.

Osteochondritis Dissecans

Mr. I. S. SMILLIE (Dundee) said it had been known for ten years that healing of the lesion of osteochondritis dissecans was possible in children, but this potentiality was lost at adolescence. He proposed deliberately to over-simplify the question of ætiology and regard it as a fracture which was never seen in the acute stage. Where the fragment remained in situ, he regarded the position as one of delayed union, requiring rest and improvement of local blood-supply. He had obtained union and healing by plaster immobilisation alone in 3 cases, and by drilling and immobilisation in 15. Where the fragment had shifted from its bed the condition was one of established non-union. He had treated 8 such cases by clearing out the bed, reshaping and replacing the loose body, drilling, and fixation by screw or special pins which were removed when union had occurred. The simple drilling operation might need X-ray control if an intact articular cartilage made localisation uncertain. He stressed that the fixation of a loose body in its bed was difficult and that this was only a preliminary report. He suggested that it might later be found possible to make use of frozen homografts to fill the cavity, and that this might open up great possibilities in joint surgery generally.

Cartilage Grafting

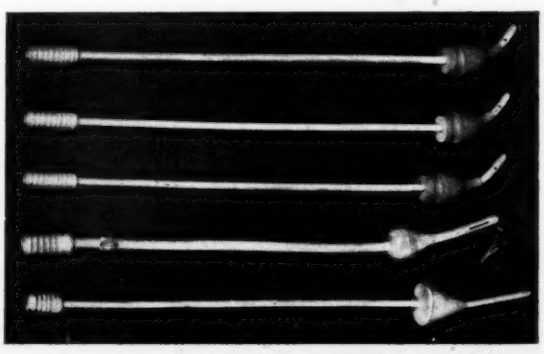
Mr. K. H. PRIDIE (Bristol) believed that in osteochondritis dissecans a vascular calamity set up a chain of events finally leading to osteo-arthritis; there was a cold area in a hot joint. As an experimental procedure in a few cases he had tried removing the loose body, excising the infarct, packing the resultant cavity with cancellous bone chips, and covering them with a thin graft of articular cartilage taken from the opposite femoral condyle. The knee was then immobilised in extension for three to six weeks. The results were very satisfactory. He had applied the same principles to the eburnated condyle in osteo-arthritic knees, gouging down to healthy bone and covering it with cartilage. He said that the cavity so formed filled up. He also showed films of a knee in which he had drilled the eburnated condyle, but did not advocate this as a method of treatment. He used a very extensive exposure in which the patella was turned downwards.

New Inventions

A MALLEABLE CANNULA FOR TUBAL INSUFFLATION WITHOUT ANÆSTHESIA

THE finding of apparent tubal occlusion on insufflation may be due not to organic obstruction but to tubal spasm possibly induced by the method of insufflation. Consequently at the infertility clinic, Manchester Victoria Memorial Jewish Hospital, insufflation is done without anæsthesia or premedication in the first place. It then has to be done with extreme gentleness because pain can cause spasm of the tubes [1]; many of these patients have endocervicitis, and the cervical canal can be very tender. Even in the absence of cervicitis, the use of a volsellum may cause pain, despite the assertion of textbooks that the cervix is insensitive.

1. Rubin, I. C. *J. Fertility*, 1954, **5**, 320.



The rigidity and length of the nozzle of the usual types of insufflator (Provis, Bonney) seem to be important causes of pain when the uterine canal is shorter than the nozzle or irregular in shape. Similarly the use of the Leech-Wilkinson cannula in the presence of endocervicitis will cause pain. The cannulæ illustrated here are graduated in the same sizes as Hegar's dilaters and are malleable so that the curve can be adjusted to the individual cervical canal, and the rubber obturator can be moved on the cannula to permit variations in length of the portion entering the cervix. They are light to handle and easily manipulated. It is rarely necessary to put any kind of traction on to the cervix, because usually one of the sizes will give an airtight junction.

Where the cervix has been lacerated or is patulous, the obturator may not be large enough to give a tight fitting. In that case a thick flat rubber disc (not illustrated), 1 inch in diameter, is slipped on the cannula in front of the obturator.

These cannulæ have been in satisfactory use for over five years, and with these instruments a painless airtight junction without traction on the cervix may usually be obtained. They are made by Messrs. Jas. Woolley Ltd., Victoria Bridge, Manchester.

I am indebted to the department of photography of the Manchester Royal Infirmary for the photograph, which shows three sizes of malleable cannulæ (above) and the Bonney and Provis types (below).

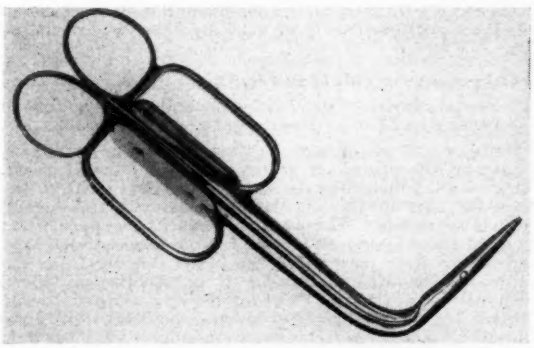
Manchester Victoria Memorial Jewish Hospital

BERNARD SANDLER
M.D. Manc., D.M.R., D.OBST.

A USEFUL PAIR OF SCISSORS

THERE are situations in operative surgery where difficulty arises in using any of the common types of scissors, mostly when the surgeon requires to cut towards himself and finds that a turn of the wrist is insufficient if the tissues to be cut lie at a considerable depth, as in choledochotomy, cholecystectomy, pneumonectomy, and lobectomy.

The modified scissors illustrated here have proved their worth in abdomen, pelvis, and chest. Since they are



modelled on garden edging-shears, the same problems of strength and length of the shafts apply here. For example, too thin or too long shafts may impair strength and efficiency because of the " whip " that occurs in use. The pair of scissors illustrated are for general purposes in length of shaft and blade, the over-all length of shaft from handle to curve being 6 inches and the blades being $^3/_4$ inch long. Finer pairs of scissors with longer handles (7 inches) or shorter handles (5 inches) and with shorter blades ($^1/_2$ inch) have also been constructed. The extra loops with flat plates on the handles were added to give stability. The loops and plates were put on both shafts so that the scissors could also be used for cutting away from the surgeon.

The curved shafts were made by Phillip Harris & Co., Birmingham. The loops and plates were made and fitted in the instrument department of the Queen Elizabeth Hospital; and I thank Mr. W. H. Biffen and his staff for their help.

Queen Elizabeth Hospital, Birmingham

A. J. H. RAINS
M.S. Lond., F.R.C.S.

Reviews of Books

Growth at Adolescence

J. M. TANNER, M.D., PH.D., senior lecturer in physiology, St. Thomas's Hospital Medical School, London. Oxford: Blackwell Scientific Publications. 1955. Pp. 212. 32*s.* 6*d.*

THIS useful and important book surveys the developmental physiology of human adolescence, including anthropometric, endocrine, psychical, and psychomotor changes over the whole period of maturation. There is no competing textbook, and one was badly needed. The difficulty of studying developmental change in man or in long-lived animals is familiar, and it has been aggravated by large secular changes in human nutrition and habits over the past century. It is now agreed that longitudinal studies are essential, especially to compare the behaviour of different somatotypes during growth and puberty. Dr. Tanner's own studies of this kind provide much of the material for this book, and show the importance of planning clinic and hospital record-keeping so that biologically important information can be readily obtained.

The adolescent " growth spurt," which Dr. Tanner discusses at length, is possibly a key to the nature of the change from the growth-economy of the child to the non-growing equilibrium of the adult which is biologically as radical as the metamorphosis of insects. Much research is being done at the moment on this and on the timing mechanism which initiates puberty, because of their connection with the problem of life-span and ultimate senescence. Comparison with other species is especially difficult because of the long interval between birth and maturation. This is probably man's prime biological difference from, and evolutionary advantage over, other mammals. The whole endocrine pattern of maturation in man differs radically from that of the rodents used in laboratory studies of growth and senescence. Dr. Tanner attempts to compare growth-curves and identify an adolescent growth-spurt in some other mammals, but his data are sketchy. He considers that the timing of puberty is primarily determined by the hypothalamus—a hypothesis which may be correct, but is rather too simple to command categorical assent at present. One striking fact about human development is that in some European countries puberty is reached three to four years earlier than a century ago, and that adult growth is completed proportionately earlier. The reasons for this are unknown; better living and nutrition are probably not the whole story, though they account for much of the shift. Dr. Tanner mentions the increased tendency to outbreeding in urban societies, but doubts its importance. The increase in developmental-rate, whatever its cause, is important because of its effects on personality, and because mammalian experiments suggest that a high growth-rate might significantly reduce the life-span. Dr. Tanner does not mention this, though he points out that optimal growth may not be maximal growth.

He describes the photographic and X-ray techniques which he used to obtain anthropometric data, and discusses the different growth-patterns of different somatotypes. The results suggest that some of the methods of the longitudinal study may be used prognostically. Comparisons of the growth of muscular coördination, maturity indices, and aptitudes in individuals of various " shapes " may prove effective in vocational selection.

Because of the interest, and the tantalising incompleteness, of the results so far obtained, all doctors, and not only research teams, should be aware of them. Observation in human biology is within the power of all doctors who take the trouble to acquire the necessary biological discipline, and vast opportunities for collecting data are being neglected. Dr. Tanner is a good biologist, whose enthusiasm is likely to prove infectious, and he has written an excellent book that will be read with profit by clinicians and biologists alike.

Differential Diagnosis of Internal Diseases

Clinical Analysis and Synthesis of Symptoms and Signs on Pathophysiologic Basis. 2nd ed. JULIUS BAUER, M.D., F.A.C.P., clinical professor of medicine, College of Medical Evangelists, Los Angeles. New York and London: Grune & Stratton. 1955. Pp. 987. $15.

IT is difficult to believe that Julius Bauer published the first edition of his classic *Konstitutionelle Disposition*

zu inneren Krankheiten in Vienna in 1917. Now from Los Angeles comes the second edition of his book on differential diagnosis, written this time in almost flawless English. As in his earlier work, this shows the same searching and provocative spirit and the same evidence of deep and far-reaching knowledge. Indeed, it is remarkable that so much of the unusual and the little known could be included in the same volume, with so much well-established information. As in all his writings, Professor Bauer provides a great many references to original papers collected from many journals in many languages. He must now be recognised as one of the greatest living authorities on rare diseases—a distinction that he combines with great breadth of vision and clarity of mind.

This book is full of interest and information, and we commend it confidently to senior as well as junior students of medicine. Certainly consultants and teachers will enjoy it and clinical clerks will find it exciting, though not perhaps ideal as a preparation for pass examinations!

Each chapter has a brief summary; there are useful illustrations; the index is adequate; and the general production is excellent. If there are from time to time some long and difficult polysyllabic words and a few involved phrases needing extra mental care, this is no serious detraction.

Advanced Surgery of Cataract

DANIEL B. KIRBY, M.D., F.A.C.S., professor emeritus of ophthalmology, New York University College of Medicine. Philadelphia: J. B. Lippincott. London: Pitman Medical Publishing Co. 1955. Pp. 271. £11.

Professor Kirby's *Surgery of Cataract*, which had a deserved welcome in 1950, is now followed posthumously by a volume which fully maintains the standard set in the first book. It not only deals with more recent advances in the subject but adds considerably to Kirby's earlier detailed descriptions of technique. His aim was to express his opinion on controversial questions in cataract surgery and to enlarge on points mentioned in his previous book which he had found important in his own practice.

Although the book is complementary to *Surgery of Cataract*, it can equally well stand by itself. It is full of interesting details on all aspects of cataract surgery and its complications, both physical and psychological. This mass of minutiæ of varying importance will make it very useful for those with personal experience of the problems he discusses. In many passages, however, there is a lack of relative emphasis which makes it hard for those with less experience to judge what is really important.

Fractures in Children

WALTER P. BLOUNT, F.A.C.S., chairman of the orthopædic section, Milwaukee Children's Hospital. London: Baillière, Tindall, & Cox. 1955. Pp. 280. 72*s*. 6*d*.

NO-ONE is better qualified to write this admirable book than Dr. Blount. As he remarks, it was "needed by the general physician, the general surgeon, and, I fear, many orthopædists"; for "the fact that most fractures in children heal fairly well with indifferent treatment has led the unwary to neglect the fact that other fractures terminate disastrously unless expertly handled." His style is lucid and pithy, the book is full of sound common sense, there is no "padding," and he has firm and salutary words to say condemning unnecessary and ill-advised operations on children. Very valuable, too, is the clear-cut advice he gives about what degree of deformity can or cannot be safely accepted when allowance for the future growth of the bone is made. He stresses the fact that early mobilisation is of no importance in children, that physiotherapy has virtually no place, and that in view of the rough treatment that many children give their plasters one need not be too careful about freeing the child's hand in the occasional difficult fracture of the forearm where deformity is so apt to recur. Many experienced orthopædic surgeons have had cause to regret their omission to take a radiograph of the normal limb, which Dr. Blount advises as a routine, with awkward fractures in and around joints.

There are very few criticisms. The paragraphs on the treatment of impending Volkmann's contracture are not very satisfactory, and there could be improvements perhaps in the account of the manipulative reduction of an avulsed medial epicondyle incarcerated in the elbow-joint. Not many British surgeons would agree with the recommendation that a green-stick fracture of the forearm should be completed without anæsthesia; the child's fearful memory of those who hurt him lasts a very long time. But this is merely a difference of practice according to circumstances, a remark applicable to the greater tendency to admit to hospital patients who would be treated as outpatients in this country.

There are excellent additional chapters on the hand and on facio-maxillary injuries by Dr. W. H. Frackleton and on cranial injuries by Dr. D. Cleveland—a subject perhaps too specialised to be included in a book of this kind. There are also some interesting observations on "wringer" injuries of the arms by Dr. I. Schulz—lesions still fortunately rare in our relatively unmechanised households. The illustrations and general production are outstandingly good—the former enhanced by attractive cartoons to bring home the unwise things that parent or surgeon may do.

Backache in Women

E. SCHLEYER-SAUNDERS, M.D., F.I.C.S. Bristol: John Wright & Sons. 1955. Pp. 80. 7*s*. 6*d*.

Few doctors find it easy to diagnose a backache, but in this small book they will find practical help. Accepted teaching is succinctly put and here and there some interesting concepts are proposed.

Readers are usefully reminded of fundamental points; for instance, that the line of gravity in the standing posture passes posterior to the bodies of the lumbar vertebræ, divides, and passes through the centre of the sacro-iliac joints to both legs. Disturbances of this equilibrium can be caused not only by pathological processes in the spine and elsewhere but also by a pendulous abdomen or a compensatory lordosis due to wearing high heels. In trying to correct a disturbed equilibrium, groups of muscles go into spasm. As long as they stand the strain, no backache occurs; when they tire, ligaments and joints such as the lumbosacral and sacro-iliac cannot bear the burden, and pain results.

Dr. Schleyer-Saunders describes in detail methods of gynæcological surgery which are outside the scope of most practitioners, yet he gives little space to the use of physiotherapy and active and passive movements in the treatment of backache. He says little, too, about the management of adhesions, yet these may cause more disability than the initial lesion.

Secretion of Adrenaline and Sympathins

Y. SATAKE, emeritus professor of physiology, Tohoku University. Tokio: Nanzando Co. 1955. Pp. 158. 30*s*.

NEARLY 30 years ago Professor Satake began his studies of the medullary secretion of the adrenal gland, using dogs which had been prepared by cutting the nerve-roots from the eleventh thoracic to the second lumbar segments. The animals thus had a permanent regional anæsthesia and he could expose the adrenal vein and collect over periods all the blood flowing from one adrenal gland without having to anæsthetise or indeed even to restrain them. The blood was assayed for its content of adrenaline-like substances (at that time adrenaline and noradrenaline were not distinguished in the adrenal secretion). In many experiments conducted over the years he was able to measure the effect of various physiological and pharmacological stimuli on the medullary secretion.

This book brings the results together. While the English rendering is at times obscure, the specialist will be glad to have a summary of this well-conceived work and a source for the extensive Japanese literature on the subject.

German-English Medical Dictionary (London: J. & A. Churchill. 1955. Pp. 513. 45*s*.).—Mr. W. O. Goulden has compiled this dictionary, which contains 50,000 medical words, with the help of his associates at Cologne University, Dr. B. Amos and others at Guy's Hospital, and Dr. Lothar Busch. He has modestly aimed only at helping the reader in the library, for he has omitted phonetic spelling and pronunciation. In an appendix he gives a useful set of equivalents which will enable the clear-headed English reader to convert simple metric measurements into the complexities to which he is accustomed.

THE LANCET
LONDON: SATURDAY, NOV. 5, 1955

Radiotherapy for Lung Cancer

RADIOTHERAPY has proved disappointing in lung cancer. No-one has yet demonstrated convincingly that it prolongs life; but clinical impressions suggest that its influence on survival is slight and unpredictable. The cases of lung cancer treated by the radiotherapist are usually incurable; but the Medical Research Council's Radiotherapeutic Research Unit, at Hammersmith Hospital, have been trying to extend the scope of radiotherapy by using it in association with lung resection, and Mr. BROMLEY and Dr. SZUR report the results in this issue.

Between 1949 and 1953, 732 patients were seen at the bronchus tumour clinic of Hammersmith Hospital. All believed to have technically operable tumours were treated initially by a course of radiotherapy. After a period of convalescence they were re-examined; and if the lesion was still thought to be operable thoracotomy was done. A further group with cancers initially assessed as technically inoperable were also treated; some of them when bronchoscoped after radiotherapy were judged to be operable, and 14 had the lung removed. 66 patients in all were treated by a radical course of radiotherapy followed by resection of whole or part of the lung. The results were disappointing. 10 (15%) died during the post-operative period—an operative mortality of the same order as that previously reported from many centres. But empyema, with or without a bronchopleural fistula, developed in 18 (27%). This incidence is far higher than that normally experienced after lung resection; and BROMLEY and SZUR suggest that it is "associated with the method of treatment adopted." It is not surprising that the survival-rates were low: thus, only 25% survived for three years and 14% for four years. The corresponding survival-rates after resection without radiotherapy are of the order of 35% and 30%, if an operative mortality of 10% is assumed.[1] Moreover, the combined treatment has other disadvantages. As BROMLEY and SZUR point out, the treatment before operation lasts about twelve weeks even if all unnecessary waiting-time is eliminated; and the patient still has to recover from the operation before resuming work. During this long preoperative period cryptic metastases may become patent, and no doubt some patients will thereby be spared unnecessary operations. But also during this period new metastases may develop. For accurate comparisons of resection after radiotherapy with resection alone it would be necessary to compare the fate of all with operable tumours treated by radiotherapy (whether or not they later had a resection) with all in whom resection was done at once.

BROOKS et al.[2] reported 4 cases in which post-mortem examination showed no evidence of residual tumour at the primary site after irradiation. In the Hammersmith series no tumour was found in nearly half of the resected lungs examined. Yet 14 of these 29 patients are known to have died with recurrence of the cancer; and the results were no better than in cases where tumour tissue was still present. The one hopeful feature is that radiotherapy appeared to have made operation possible in some patients previously judged inoperable. For instance, 11 originally assessed as inoperable because of the bronchoscopic appearances eventually had a pneumonectomy, and 3 judged initially to be in too poor condition to withstand operation improved enough during radiotherapy for a resection to be done. The final results in these 14 patients are said to have been unsatisfactory; but BROMLEY and SZUR suggest that there is a case for treating selected patients by irradiation in the hope of making them operable, although "there can be no claim that the combined treatment has produced impressive results." Their report leaves little doubt that radiotherapy before resection has little to commend it.

It is as difficult to judge the palliative effect of radiotherapy as its effect on survival. Dr. BLANSHARD[3] last week reported the results of an inquiry into the symptomatic changes in a group of 35 treated patients. A little under two-thirds showed some general improvement, half were able to lead an independent life after irradiation, and about a fifth returned to work. Dyspnœa was improved in about a half, and cough and dysphagia were alleviated in three-quarters. Hæmoptysis was lessened in more than half the patients, and chest pain was usually relieved unless it arose from direct invasion of the chest wall. Symptoms from obstruction of the superior vena cava were relieved in 5 of the 6 patients with this complication. These findings are similar to those of BROOKS et al.[2] and BROWN.[4] But this is not the whole story, for the symptoms may return; BROWN[4] reported that the improvement lasted less than three months in about half his patients. Although radiotherapy commonly alleviates distress due to obstruction of the superior vena cava, this complication also may recur before death.

There is now general agreement on the symptoms that are relieved by radiotherapy; and few would doubt that patients should be selected for palliative treatment because their symptoms warrant this, and not solely because they have cancer. But there is still doubt whether relieving symptoms by radiotherapy makes the patient's lot easier than relieving them in other ways. Few patients can nowadays be so ignorant of medical matters that they fail to associate "ray treatment" with cancer. Possibly knowledge of the truth may help some; but others may be made more unhappy, even though they cough less and have less pain. Undoubtedly the patient's mental state and the palliative result depend considerably on the personality of the radiotherapist and the outlook of his staff. There is need for more precise knowledge of the effect of radiotherapy on the patient's mind as well as on his body; but investigation of this wider aspect will be far from easy.

1. Bignall, J. R., Moon, A. J. *Thorax*, 1955, **10**, 183.
2. Brooks, W. D. W., Davidson, M., Price Thomas, C., Robson, K., Smithers, D. W. *Thorax*, 1951, **6**, 1.
3. Blanshard, G. *Lancet*, Oct. 29, 1955, p. 897.
4. Brown, D. E. M. *Brit. J. Radiol.* 1952, **25**, 472.

Immunohæmatology

AT first sight "immunohæmatology" might be thought to be concerned with blood-groups. But in fact the term denotes the study of immune reactions in blood diseases. The idea that immune mechanisms are important in the development of some blood diseases is not new; about fifty years ago WIDAL, CHAUFFARD, and other French physicians distinguished two types of hæmolytic anæmia—a congenital type with abnormal red cells, and an acquired type in which red-cell agglutinins or lysins could be detected. Subsequent workers filled in the details of the clinical differences between the two forms of hæmolytic anæmia; but in the majority of patients the presence of red-cell agglutinins or lysins could not be detected by the methods available. In 1940 DAMESHEK and SCHWARZ [1] stimulated investigation into immune hæmolytic anæmias by producing these experimentally in animals and showing that many of the features of clinical hæmolytic anæmias could be reproduced. But it was the use of the anti-human globulin test, originally devised in 1945 by COOMBS, MOURANT, and RACE [2] for the detection of weak or incomplete rhesus antibodies, that really enabled us to demonstrate with certainty the immune nature of cases of acquired hæmolytic anæmia; by the Coombs test it was shown that the patient's red cells had antibody adsorbed on to them, when the usual tests for serum-agglutinins were negative. So the position now is, as DACIE [3] says, "that the majority of patients who develop acquired hæmolytic anæmia do so because they form proteins, having the properties of anti-erythrocyte antibodies, which are capable of seriously diminishing the life-span of the patient's own corpuscles. These proteins are referred to as *auto*-antibodies in contra-distinction to *iso*-antibodies, such as the naturally occurring anti-A or anti-B and the immune type of antibody developing as the result of transfusion or pregnancy, which do *not* affect the patient's own corpuscles."

An auto-antibody is defined by DAVIDSOHN [4] as "a substance produced in our own body in response to an autoantigen, a component of our own body, and reacting with and exerting a damaging influence on elements of our own tissues"; and he points out that the idea is gaining ground that such antibodies are responsible, not only for anæmias, but also for other blood disorders such as thrombocytopenia, and for blood changes such as the "L.E. cell phenomenon." French workers,[5] have applied the descriptive term "diseases of auto-aggression" to disorders caused by antibodies or antibody-like substances produced in vivo by the patient himself. It is the study of this group of blood diseases that is comprised in the term "immunohæmatology"; and STEFANINI [6] shows in how many blood diseases immune phenomena may play a part.

STEFANINI declares that ideally three criteria should be satisfied if an immune ætiology is to be considered. These are: (1) the patient's plasma or serum should contain an agent that destroys or inhibits specific blood constituents (e.g., a hæmolysin or a platelet lysin); (2) normal constituents of blood injected into the patient's blood-stream should have a relatively short survival; and (3) injection of the patient's plasma or serum into a healthy person should temporarily reproduce the pathological blood picture. These three criteria have been satisfied in only few disorders—some cases of acquired hæmolytic anæmia and some cases of thrombocytopenic purpura—but one or two are fulfilled in many more. STEFANINI lists as hæmatological diseases presumably due to antigen-antibody reactions the following: some cases of hypoplastic or aplastic anæmia, acquired hæmolytic anæmia immunoleukopenia, immunothrombocytopenia, immunovascular disease, and some hæmorrhagic syndromes; and immune phenomena may play a part in sarcoidosis and leukæmia. The hypoplastic and aplastic anæmias concerned are those following small doses of drugs, such as chloramphenicol, or acute exposure to chemicals. The acquired hæmolytic anæmias include those associated with leukæmia, reticuloses, and tumours, in addition to the well-known idiopathic type. Immunoleukopenia can be idiopathic or be induced by drugs, or it may arise in the course of some other condition such as Hodgkin's disease. Some cases of idiopathic thrombocytopenic purpura seem to be due to immune phenomena, and drug sensitivity comes into this group too. In the class of immunovascular disease STEFANINI puts anaphylactoid purpura and some cases of polyarteritis nodosa. The hæmorrhagic syndromes are those in which an antibody develops to a blood-clotting factor—e.g., an antithromboplastin.

The evidence for the importance of immune reactions in so many blood diseases is admittedly fragmentary. One of the main difficulties is the detection of the antigen responsible for producing the auto-antibodies. The antigen is thought to be a pathologically modified normal protein, but it has not been possible to detect clear antigenic differences between normal blood-cells and those produced by the bone-marrow of patients with possibly auto-immune blood diseases. Several observations suggest that iso-immunisation may lead to auto-immunisation. An example is the drug sensitivity caused by 'Sedormid' or quinidine; these drugs probably modify platelets, thus producing iso-antibodies; later auto-antibodies develop, by a process of which we know nothing, and these antibodies act only in the presence of the sensitising drug, so that agglutination and lysis of platelets occurs when the patient is given the drug. It has been suggested that viruses and bacteria may act in the same way as drugs. This hypothesis has no very firm basis since sensitisation to drugs has not yet been produced experimentally, and there is no evidence that protein synthesis can be temporarily or permanently modified by drugs, bacteria, or viruses. Unless there is direct evidence of sensitisation, such as a positive Coombs reaction or diminished survival of red cells and platelets, there is at least equal justification for the alternative view that drugs, bacteria, or viruses damage blood elements and make them more susceptible to the normal disposal processes.

The immunological aspects of leukæmia have been little investigated, and STEFANINI draws attention to three possible examples. One is the development of an

1. Dameshek, W., Schwarz, S. O. *Medicine, Baltimore*, 1940, **19**, 232.
2. Coombs, R. R. A., Mourant, A. E., Race, R. R. *Lancet*, 1945, ii, 15.
3. Dacie, J. V. *Amer. J. Med.* 1955, **18**, 810.
4. Davidsohn, I. *Amer. J. clin. Path.* 1954, **24**, 1333.
5. Tzanck, A., Dausset, J. *Sem. Hôp., Paris*, 1952, **28**, 793.
6. Stefanini, M. *Proc. Inst. Med., Chicago*, 1955, **20**, 335.

auto-immune hæmolytic anæmia with demonstrable red-cell agglutination that occurs in the course of some leukæmias, especially chronic lymphatic leukæmia. Another is the deficiency of antibodies in leukæmia that leads to undue susceptibility to bacterial and virus infections; and the third is the occasional development of antibodies of Forssman type in leukæmia, which may be linked with the antigenic properties of leukæmic cells.

Immunohæmatology, as STEFANINI says, "while rich in speculations, is still poor in experimental facts." These experimental facts are hard to come by; the snags awaiting the investigator are many, and the techniques are difficult to apply. This is well illustrated by the contradictory results obtained by different investigators working on platelet antibodies in the ætiology of thrombocytopenic purpura.[7] Really firm knowledge of immunohæmatological disorders is still limited to the auto-immune hæmolytic anæmias[3 4]; and we have some, less complete, evidence about the immune purpuras.[8] The distinction between depression of blood-cells due to immune phenomena and that due to toxins is not entirely academic, since the method of treatment differs. If abnormal antibodies can be demonstrated and shown to be ætiologically important, treatment with cortisone or corticotrophin may hold out some hope of control; whereas if the depression is due to a toxin cortisone is unlikely to be effective, and only supportive measures, with expectation of natural recovery, are worth while.

Tomorrow's Citizens

THE upbringing of children and young people should be the concern not only of parents but of all responsible adults. *Citizens of To-morrow*,[9] a report issued by the King George's Jubilee Trust, is one of the most comprehensive accounts of young people's lives and problems since A. E. MORGAN'S *The Needs of Youth* appeared before the late war. The four working parties appointed by the trustees considered the period of full-time school attendance, the period after leaving school with particular reference to employment opportunities and conditions, young people's use of leisure time, and their experiences as members of the Armed Forces. It cannot be said that all their investigations went very deeply or that much more was essayed than the collection and sifting of the informed opinions of the many people and organisations who gave evidence. Moreover, the one piece of original research undertaken by the group concerned with National Service was somewhat oddly conceived, for they studied the impact of military life by asking questions of the young men's mothers. We all know that young men between the ages of eighteen and twenty are hardly likely to impart all their problems and experiences to their mothers, however affectionate the relationship, and it is difficult to understand why the questionary was not administered to ex-National Servicemen themselves shortly after demobilisation. But methodological considerations apart, the report is a valuable document, not only because of its findings and recommendations, but because it opens up an important field for discussion and future inquiry.

All four groups are unanimous in emphasising the importance of home life and parental training in moulding young people's lives and shaping their destinies. This theme is reiterated by Sir BASIL HENRIQUES[10]; and it is indeed echoed by most social workers and teachers. Most of our social problems involve a malfunctioning of family life, and there is a consensus of opinion that these problems can be mitigated only by trying to create good homes and loving, happy families where at the moment there are frustrations, antagonisms, disharmonies, and neglect that poison relations between husband and wife and between parent and child. Both HENRIQUES and the authors of the Jubilee Trust report are firmly convinced that this can be achieved only by a reawakening of the religious conscience and by training in spiritual values. But there is a danger apparent on reading the Jubilee report that some may seek to spread the influence of religion simply to solve social problems and reduce delinquency.

The section on education in the Trust's report displays a realistic appreciation of the difficulties facing teachers in their attempts to influence the quality of home life. Parent-teacher associations and other similar devices touch the converted parents who are keen to accept the school in a partnership devoted to their children's welfare. The disinterested parents who will not attend, who neglect their offspring and give them little incentive or encouragement, are the real problem. The group recommend that in cases where "teachers are unable to establish adequate contact with the homes of their pupils, there should be made available to the school the services of a special worker who would, if necessary, visit a home and by discussion and advice try to secure the fullest coöperation between school and parents." Such workers would endeavour to prod lazy, ignorant, indifferent parents into making a better job of their family life, and, one presumes, where necessary bring to them whatever skilled help might be at hand. If implemented, this scheme would be an interesting experiment in "aggressive casework" and the results might be startling. Such family workers would supplement the splendid work already being accomplished in a limited way by marriage-guidance councillors, by the family service units, and by other social workers committed to the task of improving parentcraft and buttressing the crumbling walls of family responsibility.

One of the distressing facts pinpointed by these books and other recent publications concerns the uncreative use by so many young people of their leisure time, and the alarming symptoms of growing public neglect of the services for youth. The magnificent partnership between voluntary and statutory bodies established during the war is in peril of collapsing for lack of support and interest. The most serious factor impairing this service is the scarcity of leaders. Too few men and women are offering themselves either as full-time paid workers or as voluntary helpers to man the clubs and youth groups; and consequently thousands of youngsters are denied opportunities for recreative education in their leisure time, and a potent weapon for combating delinquency and other undesirable forms of behaviour is being

7. See *Lancet*, 1955, i, 494.
8. Ackroyd, J. F. *Brit. med. Bull.* 1955, **11**, 28.
9. London: Odhams Press for the King George's Jubilee Trust. 1955. Pp. 142. 3*s*.
10. The Home Menders: The Prevention of Unhappiness in Children. By BASIL HENRIQUES, C.B.E., M.A., J.P. London: Harrap. 1955. Pp. 192. 10*s*. 6*d*.

allowed to rust and atrophy. Any doubt about the immense personal and social value of a well-planned, well-managed, youth club must be dispelled by the brilliant account by Mr. JORDAN and Miss FISHER of the work of their evening institute in the London area. Their book,[11] which appears at an opportune moment to remind the public of what can in fact be achieved educationally by a free community of youth under wise and expert adult guidance, may dispel the cloud of gloom and despair that might be occasioned by reading other descriptions of youth activities. Mr. JORDAN and Miss FISHER show how they succeeded in getting their members to submit to the discipline of a regular discussion group concerned with serious social topics, and how the young people became conscious of their own problems and finally set forth as social investigators in their own right to discover the facts for themselves.

11. Self-Portrait of Youth or the Urban Adolescent. By G. W. JORDAN and E. M. FISHER. London: Heinemann. 1955. Pp. 176. 12s. 6d.

Such books as Mr. JORDAN and Miss FISHER's add weight to the plea in the Jubilee Trust report for the establishment of "a broadly based national body whose business it would be to keep constantly under review every aspect of the welfare of young people whether at school, at work, or in the Services." Such an influential national youth council should make recommendations to the Government and have some power for initiating action, and not be purely advisory. It may be doubted whether Parliament would agree at once to such a council being established, or would allocate funds for many new schemes for youth and child welfare; but the idea is excellent. Only in such a way can the authentic needs of youth be kept constantly in the public conscience and a proper system of further education be maintained to cope with that "battle of the gap" which at present faces young people until the provisions of the 1944 Education Act for universal part-time education up to eighteen years can be brought into force.

Annotations

HYPOTHESIS IN RESEARCH

SPEAKING in London on Oct. 27, Sir Wilfrid Le Gros Clark, F.R.S., declared that "each step in the advance of knowledge made by scientists is the result of either the verification or the correction of hypotheses advanced by their predecessors." Sir Wilfrid, who was delivering the first of a series of lectures concerning the Scientific Basis of Medicine which have been arranged by the British Postgraduate Medical Federation, went on to say that hypotheses were no more than provisional interpretations of observed facts, and it was only by pushing them to their extreme limits that they could be validated or discarded, and thus pave the way for new observations and new interpretations. Hypotheses might be pictured as temporary bridgeheads for incursions into a territory of new ideas.

For example, there was the hypothesis which had sought to explain how it was that we could discriminate between the different sensations arising from cutaneous stimuli. Following on the resonator hypothesis of hearing, elaborated many years ago by Helmholz, which postulated that each fibre or group of fibres of the auditory nerve was related to one particular tone frequency, the idea had naturally suggested itself that a similar functional specificity of nerve-fibres for sensory discrimination might be demonstrable in the skin. This reasonable inference, which might indeed contain a large measure of truth, had been pushed further, and attempts were made to codify cutaneous sensation in terms of the sharply defined categories of touch, warmth, cold, and pain, and to relate these to different morphological types of sensory end-organs. The development of the hypothesis to this extreme had revealed its inherent weaknesses. It had now been demonstrated that all types of sensory discrimination were possible even in areas of the skin where the different end-organs postulated by the hypothesis were absent. One of the main arguments for the specificity of end-organs had been that the cornea was supplied only with free nerve-endings, that pain was the only sensation which could be elicited there, and that therefore the sensation of pain (not only in the cornea but in the skin generally) depended on the stimulation of free nerve-endings. But recently it had been shown that sensations, not only of pain, but also of touch, warmth, and cold could be elicited from the cornea. Investigations were now leading to the development of ideas of spatial and temporal patterns of stimulation of nerve-endings as the more probable physical basis of sensory discrimination in the skin.

Scientific workers seemed sometimes to deprecate the construction of hypotheses, on the ground that they were speculations and the scientist's work was to observe and not to speculate. Yet it was impossible not to speculate or formulate hypotheses in the course of a scientific inquiry—after all, that was how the human mind worked naturally. Moreover, effective observation was impossible without hypotheses to guide it; "a construction of the mind must precede the detection of a construction of Nature." It was perhaps the fate of all hypotheses to be superseded sooner or later. Hypotheses, like the men who created them, "may rise on stepping-stones of their dead selves to higher things."

CARDIOVASCULAR SURGERY TODAY

A PROGRESS report on British cardiac surgery in the latest issue of the *British Medical Bulletin*[1] gives a heartening account of developments in the past ten years. Significantly, two of the most valuable contributions come from physicians. Dr. Maurice Campbell and Dr. Paul Wood remind us of the prime importance of case selection. Their emphasis is on clinical findings—an important example to those who tend to lose sight of the patient during their calculations. Cardiac catheterisation, in fact, is not often needed in morbus cæruleus or in mitral stenosis; for changes in the pulmonary arterial pressure can generally be assessed on the clinical evidences. There is now no doubt that in uncomplicated patent ductus arteriosus in young patients operative closure should be undertaken; but the correction of aortic coarctation is more hazardous. It is best done before the age of 20–25, even though symptoms may not yet have developed. Mr. O. S. Tubbs deals with these two anomalies. He takes the middle course in the "cut or tie" controversy, and divides and sutures the duct only if it is short and wide. Arterial grafting is needed to complete about 10% of coarctation operations. The future of these patients, as Dr. Campbell reminds us, is still uncertain: the late results of homografting in man have yet to be assessed. Prof. C. G. Rob and Mr. H. H. G. Eastcott review methods of aterial reconstruction and mention recent experience with grafts made of plastic cloth.[2] Among all these new enterprises in surgery perhaps the most impressive is the story of mitral valvotomy. Mr. Holmes Sellors, himself a pioneer in this field, relates the mechanics of mitral stenosis,

1. Surgery of the Heart and Thoracic Blood Vessels. *Brit. med. Bull.* 1955, 11, no. 3.
2. See *Lancet*, Oct. 1, 1955, p. 711.

and how to relieve it, showing how much can be learnt by a discerning finger within the auricle. It will be noted that he, like Dr. Parry Brown and Dr. B. A. Sellick in their section on anæsthesia, no longer uses drugs to reduce cardiac irritability. Correct anæsthesia, and above all adequate oxygenation, now largely avert the risk of dangerous arrhythmias.

In cyanotic congenital heart-disease, indirect operations, Mr. G. A. Mason finds, have on the whole fulfilled the hopes which were held for them. They provide a very great measure of relief, which should last for many years, though, as Dr. Campbell points out, there remains the strain on the right heart which is still working against systemic pressure. The same is true after direct operations on the pulmonary-stenosis element of Fallot's tetrad. Direct operations, as they exist today, can do little more than reduce the pulmonary stenosis; but they do represent a more logical approach since they remove an anomaly rather than add yet another. They are perhaps more risky in that they involve the manipulation of an ailing heart, but they are less tedious and roundabout than the anastomotic operations. Sir Russell Brock, who has been mainly responsible for direct operations for pulmonary stenosis, emphasises that, except in pure pulmonary stenosis, the condition is still incompletely treated; only complete restoration of a normal heart action can be regarded as a cure. The prospect of achieving this has lately come a good deal nearer. To operate on the open heart with the deliberate and accurate technique of surgery in other parts of the body has been the hope of surgeons for many years. Now, it seems, the chances are good. Three completely different methods have already been used, with some success. An artificial heart-lung apparatus has for several years been the subject of research in at least six centres. Tremendous technical difficulties have been encountered. Mr. W. P. Cleland and Dr. D. G. Melrose, at the Postgraduate Medical School of London, have had their share of these: cannulation has not always been adequate (the venous return in particular is difficult to ensure); hæmostasis is troublesome, partly because anticoagulants must be used, and partly owing to platelet losses during the perfusion. The machine has, however, been successfully used in patients with mitral incompetence, and may soon prove suitable for other operations on the open heart. Induced hypothermia, as Mr. E. J. Delorme was one of the first to show, by reducing the oxygen needs of the tissues allows a greatly diminished circulation to be tolerated while heart and vessel operations involving caval or aortic clamping are carried out. Some open-heart operations of limited duration have been done with its help; and Sir Russell Brock and Mr. D. N. Ross describe their experiences with a simple extracorporeal blood-cooling coil. But the myocardium is heavy in its demands for oxygen, and below 25°C if it is manipulated irritability is intense, and serious or even fatal arrhythmia develops in almost half the cases. Selective cooling and re-warming of the heart might reduce this danger.

The third and newest of the open-heart techniques involves the use of a donor circulation.[3] Mr. A. T. Andreasen, its originator, shows how it is based on a new concept in circulatory dynamics—the "azygos flow principle." Experimentally, clamping the venæ cavæ, so that the only venous return to the right heart is the azygos flow, has been shown to reduce the cardiac output to less than a tenth of the accepted minimum value, yet the animal survives. If a donor cross-circulation is used to provide this new low minimum, operations can be done with safety within the excluded heart. We may perhaps have been over-conservative in not applying this brilliant British discovery to patients. There can be no possible ethical objection to the use of parent-donors. That the risk to them is small has now been shown by Lillehei and his co-workers,[3] who have successfully repaired many ventricular septal defects under cross-circulation with unprecedented therapeutic success and no deaths among the donors.

Which of these widely differing methods will prove the best has yet to be seen. Here the *Bulletin* leaves us, intrigued and wondering, with the open heart perhaps just ahead as the only possible solution to the problem of correcting the grosser malformations and the even more pressing need for effective repair of valvular incompetence.

3. See *Ibid*, Oct. 8, 1955, p. 756.

PARTHENOGENESIS IN MAMMALS?

THE possibility that a woman might become pregnant without at least one spermatozoon having entered the uterus is not one which the "reasonable man" would lightly entertain. Scientific opinion for several centuries has sided with the reasonable man; but today biologists, and cytogeneticists in particular, would be less dogmatic in dismissing such a possibility. To them the rarity of spontaneous parthenogenesis in vertebrates is ground for remark.

Some considerations of this kind were discussed last week by Dr. Helen Spurway, lecturer in biometry and eugenics at University College, London, in a lecture entitled Virgin Births. The occasion of this was the observation that in the guppy (*Lebistes reticulatus*), a small live-bearing fish, females segregated from birth are sometimes fertile, giving birth to litters which consist almost entirely of females (1 male and 1 intersex have been recorded out of 92 fatherless offspring). Since spontaneous parthenogenesis is so rarely described in vertebrates, it is important to determine whether this is an example of it or of the alternative possibility—self-fertilisation in a hermaphrodite producing both sperms and ova. The studies which Dr. Spurway has undertaken suggest that both these processes may possibly be occurring in lebistes. A third possibility—that the embryo fish have been fertilised in utero by paternal sperm—can be excluded on genetical grounds, and in view of the abnormal sex ratio.

Hermaphroditism, in which the same individual produces functioning ova and sperms (usually alternately or successively rather than at the same time), is already known in fish and amphibia, and occurs on occasion in birds, where the destruction of the ovary may be followed by the regeneration of a serviceable testis. Parthenogenesis, in which an ovum begins to divide "of itself," producing a haploid embryo, or recouping the missing paternal chromosome complement by some form of doubling, is much rarer in warm-blooded vertebrates, but it is common in invertebrates. Parthenogenetic cleavage has been reported in cat [4] and ferret [5] ova, and lately in unfertilised turkey eggs.[6] None of the embryos have been shown to be viable. But parthenogenetic development going to full term, and producing a viable and healthy offspring, can be induced in mammals by cooling the fallopian tubes, and many fatherless rabbits have already been reared by this technique,[7] though the failure-rate is high. In view of this, we may have to re-examine the justification for our belief that spontaneous parthenogenesis is rare in vertebrates and absent in mammals. If it were rare in mammals but occasionally present, would it in fact be noticed? For the event to be recognised, Spurway points out, it has to occur in a species which is under observation in stringently critical conditions, and whose sexual cycle is thoroughly familiar; and the offspring should preferably be distinguished from sexually produced offspring by an obvious character. In some cases, such as that of the turkey eggs, the character

4. Strassmann, E. O. *Amer. J. Obstet. Gynec.* 1949, **58**, 237.
5. Chang, M. C. *Anat. Rec.* 1950, **108**, 31.
6. Olsen, M. W., Marsden, S. J. *Science*, 1954, **120**, 545.
7. Pincus, G., Shapiro, H. *Proc. nat. Acad. Sci., Washington*, 1939, **26**, 163.

may be simply inviability. If mammals produce fatherless offspring at all, they would almost certainly have to do so by parthenogenesis, and not by self-fertilisation in a mixed gonad. Quite apart from the mechanical complexity of mammalian fertilisation and pregnancy compared with that of fish, most mammals cannot produce live sperms at body-temperature.

There are sound reasons which might lead biologists, if not to expect parthenogenesis occasionally in mammals, at least to look out for it. Many breeders of laboratory animals will privately admit to having met a few examples of pregnancy in segregated females for which "mating through the wire" with a hypothetical "escape" is not a fully satisfying explanation. Although the analogy with spontaneous generation in cultures is close, a rare event which is hard to prove is likely never to be reported at all if it is also an event which according to common experience is "known" to be impossible.

Man is clearly the mammal in which parthenogenesis would be least likely to pass unnoticed. If it does occur at all it is extremely rare. Suppose that its frequency were to be only one-half that for the birth of sextuplets—another rare event which undoubtedly does occur (with a frequency of about 1 : 80[5] pregnancies or less). Most of these cases would occur in women with a history of recent intercourse, and would be missed. In the few which might remain the chance of any woman successfully asserting the facts in face of an evident pregnancy would be small enough to make her keep her own counsel. Perhaps, as Dr. Spurway remarked, claims might be entered with more confidence if the women concerned knew that today these could be vindicated beyond any reasonable doubt. The offspring of parthenogenesis would be a female, or less probably an abnormal male, and its immunological make-up would be such that it could be recognised with absolute certainty—"no specialised knowledge would permit faking." Most claimants could be sifted on the repertoire of blood-grouping tests alone. The culminating proof would be the ability of the mother to take a skin-graft derived from the child without breakdown and with indefinite persistence of the graft. (Dr. Spurway emphasises that the reciprocal need not be the case—the child could have only the mother's antigens, but it need not have all of them.) To biologists such evidence would be conclusive; and recognition of such a case might spare a patient some of the effects of an emotionally difficult situation. But if parthenogenetic births do occur, not all will occur in circumstances which lead to strife. They could be recognised most easily in retrospect, by immunological comparison between a mother and the daughter who strikingly resembles her. They might show a familial distribution.

Whether it is worth doing more in this matter than keeping our eyes open when we conduct a research that might reveal such a case, and awaiting claimants, is doubtful. But if such a claim were now made it could be proved. Possibly some of the unmarried mothers whose obstinacy is condemned in old books on forensic medicine, or cited as a curiosity by their contemporaries, may have been telling the truth.

STRUCTURE OF CORTICOTROPHIN

THE establishment of the structure of oxytocin and pitressin [1] showed clearly that the protein chemists now have refined techniques for exploring the structure of polypeptides. Recently these methods have laid bare the structure of corticotrophin. This is a long-chain polypeptide, whose structure was analysed by a process that may be likened to doing a jigsaw-puzzle in reverse. It was fragmented by enzyme attack into a few polypeptide units. Each of these in turn was broken down by a chopping process until recognisable fragments were found and the sequence of the amino-acid residues in the original molecule was established.

Two independent schools, one working on β-corticotropin from pig pituitaries,[2] and the other on α-corticotrophin from sheep pituitaries,[3] have established that the structure of these pituitary hormones is remarkably alike. In each case the active molecule appears to be a straight-chain polypeptide of 39 amino-acids; the porcine corticotrophin differs from the ovine only in the replacement of one serine unit by leucine, together with the slight rearrangement of four amino-acid units. The synthesis of either molecule will be a formidable task.

1. See *Lancet*, 1953, ii, 842.

PYRIMETHAMINE IN UVEITIS

RECOGNITION that toxoplasmosis is an important cause of uveitis in adults dates from the histological observations of Wilder,[4] who first demonstrated the parasite in necrotic choroidal foci. Her observations have since been confirmed,[5] and the parasite has been identified in the excised eye in a case of uveitis.[6] Previously the only recognised form of ocular toxoplasmosis had been that in infants with congenital infections characterised by the triad of choroiditis, cerebral calcification, and a positive serological test for the disease.

The diagnosis of ocular toxoplasmosis depends on serological tests; and Woods and others [7] and Smith and Ashton [8] have found a high rate of positive tests in the groups they term granulomatous uveitis and posterior uveitis. But Smith and Ashton point out that toxoplasma antibodies are widespread in the community, and so, in the absence of a rising or high antibody titre, the diagnosis cannot be made with certainty.

The difficulty of diagnosis might be reduced if there were a specific antitoxoplasmal drug, the response to which would establish beyond doubt the presence of this disorder. Of the drugs that have any appreciable antiparasital action only pyrimethamine ('Daraprim') has the necessary specificity. The activity of pyrimethamine was investigated by Eyles [9] and confirmed by Summers,[10] and by Trevino et al.[11] who suggested that there was a strain difference in the sensitivity to the drug. Ryan et al.[12] noted the value of this drug in combination with sulphonamides [9] in uveitis.

At a meeting of the ophthalmological section of the Royal Society of Medicine on Oct. 13, Dr. C. H. Smith reported on the use of the drug in experimental choroiditis. Although the strain used was highly sensitive to pyrimethamine, this did not modify the lesion, and attempts to increase the local concentration by subconjunctival injection led to cataracts. Mr. E. S. Perkins described the use of the drug in a clinical trial and noted that the objective response to treatment was greatest in cases with serological evidence of toxoplasmosis; he suggested that the difference between the results in treated and in untreated cases was only just significant statistically; but, because of the care taken to exclude bias in the trial, even this slight difference is important. Mr. Perkins remarked that treatment must be closely supervised, since blood changes, such as macrocytic anæmia and neutropenia, sometimes arise.

2. Bell, P. H., Davies, D. S., Eignet, E. A., Shepherd, R. G., Howard, K. S. *J. Amer. chem. Soc.* 1955, **77**, 3419.
3. Li, C. H., Geschwind, I. I., Cole, R. D., Raacke, I. D., Harris, J. I., Dixon, J. S. *Nature, Lond.* 1955, **176**, 687.
4. Wilder, H. C. *Arch. Ophthal. Chicago*, 1952, **48**, 127.
5. Duke-Elder, S., Ashton, N., Brihaye-van Geertrudyden *Brit. J. Ophthal.* 1953, **37**, 321.
6. Jacobs, L., Fair, J. R., Bickerton, J. H. *Arch. Ophthal., Chicago*, 1954, **51**, 287.
7. Woods, A. C., Jacobs, L., Wood, R. M., Cook, M. K. *Trans. Amer. Acad. Ophthal. Otolaryng.* 1954, **58**, 172.
8. Smith, C., Ashton, N. *Brit. J. Ophthal.* 1955, **39**, 545.
9. Eyles, D. E., Coleman, N. *Antibiotics* 1953, **3**, 483.
10. Summers, W. A. *Amer. J. trop. Med. Hyg.* 1953, **2**, 1037.
11. Trevino, A., Varela, G., Palencia, L. *Rev. Inst. salubr. Enferm. trop., Mex.* 1953, **13**, 339.
12. Ryan, R. W., Hart, W. M., Culligan, J. J., Gunkel, R. D., Jacobs, L., Cook, M. K. *Trans. Amer. Acad. Ophthal. Otolaryng.* 1954, **58**, 867.

In the Mental Hospital *

THE FORGOTTEN PATIENT

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II. ONE SOLUTION

IN my first article I described the unhappy conditions to be found today in many of our mental hospitals, and suggested that some useful reforms are possible without spending money.[1]

A year ago I gave an account of an experiment made on the male side of this hospital,[2] and I shall now carry this account a little further—not because we are content with what has been achieved but because it shows what can be done in an ordinary medium-sized hospital without any special advantages. It is true that this hospital has a regional hospital board which views experiment sympathetically, that the hospital management committee is active and cooperative and widely regarded in the hospital as a great asset, that all the administrative staff are helpful with every problem that arises and it is unnecessary to single one department from another, whether its responsibilities lie outside or inside the walls of the building. But there are presumably many other hospitals equally fortunate in these respects.

Progress Report

The male side has about 500 beds, there are 90 nurses of all categories. There are always two doctors working on the male side and there may often be three, but one of them is away from the hospital on other duties every afternoon. Inadequate as the staff is, it is better than in some hospitals; so here we have some slight advantage. The admission-rate is not high, but for practical purposes neurotics are treated at outpatient clinics. The admission-rate and the number of patients of the male side of the hospital for the past ten years are as follows:

	Admissions	*Total no. of patients*
1945	79	494
1946	100	490
1947	110	460
1948	149	467
1949	165	498
1950	178	486
1951	193	490
1952	241	511
1953	265	496
1954	286	477

The experiment was started without premeditation on April 1, 1953, and the following figures for the chronic wards show how we have got on:

	1952–53	*1953–54*	*1954–55*
Number of patients transferred from admission ward	55	74	73
Number of deaths	13	30	31
Number of patients discharged ..	33	63	103
Average no. of patients in wards ..	449	447	429

At the beginning of the experiment about 30% of the patients were in unlocked wards. Now the proportion is 90%, and when I look at these remaining 10% I have little doubt that in a year or so there need not be a single patient kept behind a locked door. Figures are often misleading, but there are fewer male patients in the hospital now than two years ago, though the number of admissions has increased and patients are not admitted for trivial reasons.

* A group of articles chiefly concerned with the value of active occupation and work for mental patients and the means whereby it is best provided.

1. *Lancet*, Oct. 29, 1955, p. 917.
2. *Ibid*, 1954, i, 924.

GENERAL METHODS

The object of treatment is to discharge the patient so that he can take a useful place in the community again. There is no point in discharging patients merely for the sake of discharging them. Patients will have to conform with the community after leaving hospital, and they have to do so within the hospital. Life in our hospital is therefore disciplined and well ordered, but we arrange that patients gain by behaving well rather than lose by behaving poorly. We believe that all the men are happiest when they are working and that they most enjoy work which they share with others, about which there is no compulsion, which is useful, and which has a finished product which they can see. They are encouraged if their work is critically examined and praised when good. They are made to feel that their progress matters, by their psychiatrist trying to speak a few words to each every morning. If they ask for leave and it is refused, they are told the reason for the decision and how it can be reversed. If they feel they are unfairly treated, they are encouraged to seek an interview with the hospital management committee. If a patient fails to help the community by doing as much work as he is thought capable of doing, he is sent to another ward—not necessarily a less comfortable one—where his day's routine is more closely ordered and where his personal responsibilities are less. If a patient fails to behave well enough to remain in a ward, the psychiatrist asks himself how he came to overestimate that patient's powers, how he caused that patient to fail. He does not say "That patient has had his chance and he won't get another in a hurry. It's somebody else's turn now." If a patient behaves badly, perhaps he needs less, not more, discipline. If he escapes, perhaps that is a sign that he is ready for discharge. Patients are not lightly discharged. If the psychiatrist has a code which governs his relations with his patients, it is to be quick to praise and slow to criticise and never to blame.

In a hospital one or two wards are sometimes regarded as the stars, but this does not happen with us, except that in wards where progress seems difficult the greatest attention is given. A great strain is placed on the nurses at the start of each fresh scheme; though they are glad to be nursing, they are accepting extra responsibilities and work.

For nearly two years we did not ask for money; but when we had proved that we were in earnest and willing to work without an extra grant, a sum of money was spent on the furnishings of the wards, and now a third of them are very comfortable.

SPECIAL GROUPS

Some Young Men

A villa of 40 beds was allocated to young schizophrenics who had no reasonable chance of ever leaving hospital and for most of whom even day-leave was impossible even if their relations could be persuaded to visit them. Their average stay in hospital for their present admission only was seven years. Their average age was thirty-two years. 12 of them had received courses of electroconvulsion therapy (E.C.T.) alone. 7 had also had deep insulin-coma therapy. 1 had had both these treatments as well as being leucotomised, and 5 more had had E.C.T. and leucotomy only. 9 others had been leucotomised and received no other form of physical treatment. They had all had every form of physical treatment which was thought likely to benefit them. Some of it, I feel, was misguided. A past prefrontal leucotomy may be the only thing that makes a patient's recovery impossible. Of these patients only half a dozen could carry on a conversation, and most of the others were incapable of replying logically to a simple question or were largely mute. This was not due to recent

neglect, because over the previous year a considerable effort had been spent on their care; but this effort had largely been for the forenoon and the afternoon, and had not included all their waking day. Most of the patients were in constant need of care with their dress and their washing. The following simple daily routine was planned:

They were grouped in tens and slept, rose, washed and dressed, ate, played and worked in their groups, always having the same nurses with each group. In the working day they wore battle-dress. They had to keep this neat, their hair brushed, their shoes clean. They had to shave themselves like practically every other patient in the hospital. They had to wear a necktie except during hard work and games. At 4 P.M. they all changed into lounge suits. Each group had special duties each day. Every week each group changed duties with another, so that their weekly routine was different for four successive weeks. The details for two days are given below:

		Tuesday	*Wednesday*
Group 1.	A.M.	Mess duties	Mess duties
	P.M.	Bowling-green construction	Bowling-green construction
Group 2.	A.M.	Bowling-green construction	Bowling-green construction
	P.M.	Country walk	Hockey. Educational discussion
Group 3.	A.M.	Educational discussion. Lacrosse	Country walk
	P.M.	Carrying ashes to bowling-green	Carrying ashes to bowling-green
Group 4.	A.M.	Bathing	Carrying ashes to bowling-green
	P.M.	Educational discussion. Hockey	Educational discussion. Lacrosse

When the occupational therapy unit is reopened, we hope to substitute some sessions there for wheeling ashes, necessary though this is. Each group in turn act as messmen for a week. This means that in the forenoon they tidy the dormitories, the dining-room, and the sitting-room, wash up the cutlery and crockery, and fetch the laundry and the food from the central kitchen. No patient is allowed to appoint himself as the kitchen worker.

To say that miracles have been worked with these unpromising patients would be false, but there are good signs. Within two months the charge nurses were asking for the door to be unlocked. One patient has tried to run away and one has succeeded. One curtain has been torn, one coat has been damaged. A peculiarly restless patient, classified as suicidal and homicidal, whom the relatively liberal régime of the year past had done little to improve, became one of the nicest men in the hospital; neat and polite, very hardworking, and able and willing to carry on a sensible conversation. When we see the pleasure he gets out of working it is a little humbling to think that he had never before been given the chance to do it. Two years earlier he was quite rightly accompanied everywhere he went by a nurse. Today he goes where he wishes within the grounds and nothing stops him from being granted leave save his reluctance to leave the hospital.

On some evenings, groups are allowed to stay up to the end of the television programme if they wish. They enjoy their walks into the nearby village and across the fields. We try hard to get them home for the weekend, and we find that the most unlikely relations are willing to try the experiment. On the first visits a nurse may accompany the patient. Then the family say they would like to try on their own.

Lacrosse, tennis, and hockey were chosen as the games to be played because they would be unfamiliar and initially difficult. The educational discussions are arranged a week in advance and we try to choose a topical subject which appeals to the nurse holding it. Subjects lately chosen have included: how to run a small holding, chrysanthemum growing, dairy farming, the Liberal point of view, local government, the job of a cricket captain, care of a motor-bicycle, prospects for the Derby, and how to run a seaside boarding-house. Discussions are not high-faluting, but one does get a discussion of sorts; and, bearing in mind that the natural inclination of nearly all these patients would be to keep apart from one another and never utter a word, we feel that progress is being made. One young man who for eighteen years had been smiling and grimacing to himself, wildly gesticulating, and constantly talking or shouting out to himself, often striding up and down and never saying a sensible word, is now a neat hard-working, quiet, pleasant man. He does not speak much, but what he says is nearly always sensible and he can talk well about music. Another man has a mother who was told ten years ago by a psychiatrist that she should forget she had a son, and should never visit him because he was incurable. He now goes home on leave.

At present a bowling-green is being constructed, and once this is done many other tasks suggest themselves. A long jump, a swimming-pool, a tennis-court, and so on. On these and all other activities every patient in the hospital gets a hot drink in the middle of the morning.

Of course things go wrong. Patients are sent on leave when they are not fit. Occasionally a patient wanders away. Someone is discharged and immediately relapses—but these are not faults of the system but in the psychiatrist's judgment.

Some Older Men

There are another 90 patients—schizophrenics, mental defectives, general paretics, epileptic psychotics—who are not fit at the moment to work without supervision. Most of them are over forty years old. They are in two wards—one locked, the other open. In each ward the patients are divided into small groups of about 12 and again each group is kept under one nurse for two months at least if possible. Again all members of each group do things together.

In the forenoon one group is responsible for tidying the ward and in the afternoon it plays games. The other groups may be carrying cinders from the ash-heap of many years past to a cinder-road which it is hoped will encircle the grounds. Another may be digging out this road, a third rolling the cinders in, a fourth doing physical training. There is a special group of middle-aged catatonic schizophrenics whose statuesque poses or restless purposeless activity once seemed to defeat every attempt to help them. Their present varied and active day is the remarkable achievement of their two nurses, one a nursing assistant. The problem of paid work for chronic psychotics might be solved by contract work for outside farmers. This autumn we have sent some parties to the potato-picking on neighbouring farms. Patients and nurses alike have welcomed these expeditions, which offer fresh faces, picnic meals, new scenery, and a coach ride. For each day he works a patient pays 2*s.* 6*d.* to the hospital, and the whole of the money that the farmer pays is divided between the pickers.

The old men are given a pleasant day, but we try to lend some point to it by seeing that they join in some communal activity and always have a walk and a rest in the fresh air. Some of them largely look after an open-ward garden. They may, as will physically enfeebled psychotics, do useful tasks in a large day-room or in a garden. They scrape old bedsteads and revarnish them, mend canvas chairs, clean cutlery and metal jugs, play card games and dominoes, and rarely make woollen rugs.

LINKS WITH THE COMMUNITY

In other wards the patients are all usefully working in the gardens; in the kitchens, or with the porters; but they are not lost on these tasks. We try to find them outside employment, sending them for interviews to see whether they are fit for the industrial rehabilitation unit in Hull, and trying to get their relations to accept them at home. I may mention that the charge nurses of these

wards of up to 80 patients not only work short-handed so that other wards may have more nurses, but also have willingly moved from a small ward to a large and inconvenient one for no other reason than the good of the hospital.

A large piece of land was set aside for a nurse to look after, and he has turned this into allotments for some 15 patients and also to grow flowers for the wards. The patients who work these allotments are outpatients, but they are not from the admission-wards or the outpatient clinics. They come from the chronic wards and they are all people who would still be inpatients if this provision had not been made. Some are boarded out or on trial, but most were discharged to their homes with this daytime occupation provided. They come from 9 A.M. to 4.30 P.M. Their bus fares are paid and their midday meal provided and part of what they grow is theirs to take home. That they like this work, as do the inpatients who also help, is shown by the fact that they ask to be allowed to come on bank holidays, and that snow and rain are no deterrent.

From time to time a patient is found a job and leaves. Other discharged patients may attend the occupational-therapy department and no patient is discharged from the chronic wards until there is something definite for him to do and somewhere for him to go.

Voluntary organisations who visit the hospital to entertain the patients are another link with the outside world; but I sometimes feel that entertainments are generally designed to keep the patient contented rather than to aid his recovery and discharge. This is particularly true of concert parties and films. Those who hold concerts do so for the pleasure of small numbers of the staff and not for the patients. Generally speaking, patients go to entertainments quite mechanically and take little notice of what is going on, for films and concerts stick to their particular norm and provide no stimulus. For years I have been asking patients the name and the plot of the film they saw the previous evening and I never got any answer suggesting that any impression had been made or retained until J. B. Priestley's *An Inspector Calls* was lately shown. In many hospitals the patients' sports day is a remarkable institution. Chronic patients leave the wards and airing-courts for this one afternoon and watch and probably sit contentedly without any thought of running away, and yet the following day they are locked away for another year. Sometimes there are more events for the nurses than for the patients.

Some Results

The material with which we deal is not easy, because the admission and convalescent units are efficiently run and we receive only their failures.

It is interesting to see what has happened to the 265 patients, including 100 readmissions, admitted in 1953.

11 died in hospital, 7 during the first year.

25 have never left the hospital.

14 are still in hospital, but have all been discharged and readmitted since 1953.

49 were discharged in 1953, have since been readmitted, and are now again discharged.

Of the 25 patients who have never left the hospital:

8 came from other hospitals (4 foreigners with schizophrenia, 2 schizophrenics, and 1 consumptive mental defective).

17 were direct admissions (5 with gross organic brain damage, 3 mental defectives, 1 recurrent depressive, and 8 schizophrenics,) Of these, 3 are likely to be discharged this year.

Of the 14 patients who were discharged but readmitted and are still in hospital, 2 have gross organic brain damage, 4 are depressed (1 with tuberculosis), 1 is in mania, and 7 are schizophrenic. Of these, 8 are likely to be redischarged this year.

Conclusion

Many of our mental hospitals are depressing, inconvenient, ill equipped, and understaffed. The psychiatrist often feels that he is expected to undertake an arduous and exacting task without reasonably adequate equipment and help. But he ought not to be easily overwhelmed by material handicaps. In our hospital, without spending extra money or obtaining extra staff, we have reorganised the male chronic block.

Our results can no doubt be improved, but they show how much can be achieved by the doctors and nurses alone. They also suggest that much more can be done for the chronic patients who spend long years in hospital, too often existing rather than living in drab conditions more conducive to physical and mental deterioration than to cure. In solving the problem of overcrowding, positive therapy may well be more important than new buildings. Given help, many so-called chronic patients prove themselves able to return to the community. Those who must remain in hospital should be the psychiatrist's special concern. Without his aid, they only too easily lose their tenuous links with relatives, friends, and ordinary life.

If the community is to fulfil its responsibility towards these people they must no longer be allowed to become the forgotten patients of our mental hospitals.

Early in their career most psychiatrists have felt that they knew how to improve the lot of the patients in their hospital. To do this, however, they needed the support of their physician-superintendent and the senior nurses; and, for a variety of excellent reasons, such support has rarely been given. I would be ungrateful indeed if I did not say how much I am indebted to Dr. H. B. Miller, physician-superintendent of the De la Pole Hospital, and to Mr. P. Archer, chief male nurse.

Special Articles

UNRESTRICTED VISITING IN A CHILDREN'S WARD

EIGHT YEARS' EXPERIENCE

MARION IEVERS
S.R.N.
SISTER IN CHARGE OF THE CHILDREN'S WARD

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PHYSICIANS

QUEEN VICTORIA MEMORIAL HOSPITAL, MELBOURNE, AUSTRALIA

IF a child is old enough to understand, his parents can explain to him that he has to go to hospital to be made well. Some children look forward to a time in hospital as an adventure. Even those who are distressed at leaving home can understand that it is for their benefit. But the younger child feels only that he is taken from his mother and familiar surroundings and abandoned by his parents to strangers in a strange world. The most independent young child wants only his mother when he is sick, and to deprive him of his mother at that time imposes on him a double burden. It is wrong to assume that the child who does not cry or make an outward showing does not mind being left. The young patient who "frets inwardly" is a real entity.

The very young child separated from home and parents and facing the abnormal life of hospital feels forsaken and alone. Not only is he taken from his mother, he is looked after by nurses who change every eight hours or more often. This lack of continuity increases his forlornness and distress.

For the past eight years we have encouraged parents, adult relatives, and friends to visit our children's ward

at any time of the day or night. We have not found it necessary to ration the number of visitors at any one time. When the whole day is available and not a set limited period, the visitors, of their own accord, spread themselves over the day by arrangement between themselves. Usually there are one to five visitors in the ward. Seldom is there no visitor present.

The ward takes 30 to 40 children, girls up to the age of fourteen years and boys to the age of seven. Babies up to the age of a few months are nursed in a special ward off the main ward. The cases are both surgical and medical.

How the Parents Help

The parents sit with the children and take their babies in their arms if the child is well enough and is comforted by nursing. They read to the children, play with them, give them their food, and settle them down for the night, and in fact perform any parental duty which they want to do and which the condition of the child allows.

As well as entertaining their own child and any other children in the vicinity, the parents, if they wish, make the bed and change the baby. They are supervised at first to note their standard of hygiene, and if it is faulty it is tactfully corrected.

If we find them reliable we allow them to test urine and help with the simpler treatment. If the child has to undergo some unpleasant treatment—such as intravenous infusion, injections, or paracenteses—the parents may help to hold the child if they so desire. The child gains comfort and confidence from the nearness of his parents.

The parents know their own child in health, and, if intelligent, they will detect small variations in his condition more quickly than even an experienced nurse.

To the sick child with the flagging appetite, even the best hospital food may be uninviting. This is especially true of the children of foreign parents. The parents know the child's preferences and distastes and can help in procuring dishes which the child relishes. Contrary to our expectations the domestic staff have welcomed them into the ward pantry and helped those who wanted to make special dishes for these children.

A tray is kept set with crockery and tea, and any visitor who is staying a long time may go to the pantry and make tea and have simple refreshment.

When the child is admitted we have found it best for the parent to stay till the next meal and then settle him to sleep. The mother gives him a toy and tells him she will be back tomorrow. If the child cries and is wakeful he is given a sedative. After twenty-four hours the children will usually wave goodbye with equanimity and after the second day they rarely cry when left.

Some parents are upset if the child cries when they leave. It is a good plan for them to wait and watch the child from some vantage-point where they cannot be seen. They will see how quickly the crying stops and the child settles, and they will go away comforted.

We always tell the child the truth. To an older child admitted for operation, it is explained that he will be put to sleep to be cured, that it may be uncomfortable for a time, but that his mother will be there when he wakes up.

Benefits

We believe that unrestricted visiting by the parents is good for the child, the parents, the nurses, and the resident medical staff. A great deal is learnt about the social background of the patient, the attitude of the parents to the child and to each other, and the type and capabilities of the parents.

To the Child

The main benefit to the child is the sense of security he gains. He realises that his parents have not deserted him and that when they go away they always return. They remain part of his life away from home. The importance of this security, both during the time in hospital and later, cannot be overstressed. One of our nurses still remembers vividly her grief of seventeen years ago when, as a patient in a children's hospital, she stood crying for her mother at the ward window while her mother, who was not allowed to visit her, stood weeping in the street below.

The child who is away for any length of time loses his place in the family. If the parents visit the child daily he is kept in touch with the family doings, and they with his. If the other children are brought to the door of the ward to wave, as we encourage, the ties are kept still closer. Also, the infant often needs physical contact with his mother, and this may soothe him better than sedatives.

Not only is a parent's knowledge of the child's feeding pattern useful, but sick children will often eat better when given meals by their parents than by strangers.

A 2-year-old girl who had been desperately ill with acute laryngo-tracheo-bronchitis, necessitating tracheotomy, obstinately refused food. She was a country child whose father had stayed in the city to be with her. The father finally succeeded in getting her to eat by placing himself in the 'Oxygenaire' tent with her while they both drank some beer and ate ham sandwiches.

Many children, in going to sleep or taking meals, have little habits which mean a great deal to them. The parents are helpful with these fads which, though trivial, may have important effects.

A little boy of $2\frac{1}{2}$ years had subacute nephritis with gross œdema necessitating the insertion of numerous needles in lieu of Southey's tubes. He had earlier been treated in another institution and had been splinted, which had caused him constant distress and agitation. In our ward his parents, who had previously sat with him, continued to do so. The child required no splinting and was quite unconcerned and happy throughout. The parents were greatly impressed by the difference in his behaviour.

Another child who had been in hospital for months with tuberculous meningitis from which she recovered had to be admitted later for another condition. She came into the ward willingly, bade her mother goodbye happily, and settled down without any distress.

While some routine is essential in a hospital ward, the presence of the parents prevents routine becoming unnecessarily rigid.

As parents visit at different hours, some parent is usually in the ward who, while amusing her own child, has time to give to the others in the beds alongside. This greatly lessens the loneliness of the children.

To the Parents

To the parents the main advantage of the visiting is that it gives confidence and lessens the strain of parting. They become part of a team caring for their child and this satisfies the urge to be doing something active. They see all the work done for the patient and come to realise the extent of the care given. They are reassured that nothing is "covered up" or hidden. They also learn how to carry out simple treatment, such as applying splints for eczema or giving injections for diabetes.

The over-anxious parent is helped to get a sense of perspective by mixing with the parents of the other children. Mistakes in handling and management of the child can be observed, and a mother can be helped to care for her child in a more sensible manner and to understand that her many fears are groundless.

Parents who are inclined to "dump" their children and evade their responsibilities have their interest in the child increased. The parents of children with incurable conditions often find their grief eased by talking to the staff.

In addition the parents watch all procedures with a close eye and have at times pointed out errors and possible improvements. Their criticism has usually been constructive.

The traditional visiting-hours are usually awkward for the mother in the home and impossible for the father on shift work. Unrestricted visiting-hours do not disrupt the routine of the home.

A feeling of cameraderie springs up between the parents and the staff. On one occasion, when it became known that the father of one of the children was too ill to work, the staff of the ward collected a handsome amount for the family.

With foreign families free visiting is particularly important, for in these cases the language bar may prove distressing to both child and parents.

To the Nurses

Nurses who have worked under different régimes have been enthusiastic in their approval of free visiting.

The nurse can visualise the child in the family setting and not merely as a little sick patient in a hospital bed. She also gains extra training in maintaining successful personal relationships, and from her contact with the parents she is sometimes able to glean information of clinical value. She realises that it is part of her work to listen to the parents and to help them as much as she helps the child.

A capable and efficient mother considerably lightens the nurses' work and by her comments helps the nurses to accept constructive criticism.

With unrestricted visiting, the visiting-hours are automatically staggered, and there is none of the exhausting rush inevitable when all the parents arrive together and leave together—after which all the children cry together.

To the Residents

The honorary and senior staff, in their contacts and conversation with the relatives, are able to demonstrate the correct relationship of the doctors to parents and patients. The residents learn to listen and to obtain valuable information. They also learn to handle people.

Frequent contact with the parents gives the young doctors an increased sense of responsibility and enables them to see the patient as a sick child, not as a clinical exercise. It also gives them the opportunity of assessing the worth of the parents, so that they are less likely to use the escape mechanism of those practitioners who attribute all the ills of infancy to "maternal mismanagement."

Disadvantages

There are inevitably some disadvantages. There are some parents who will not complain to the sister-in-charge, but telephone the doctors about minor matters. The occasional parent will be oblivious of the life-saving treatment given and will complain of small things—feeding being a little late or the nurse using the wrong washer. Foreign parents who do not understand English will sometimes give food to a child shortly before an anæsthetic is to be administered.

One big difficulty is that parents persist in asking nurses for information about the child instead of asking the sister-in-charge. They may be given conflicting reports from different people and then confusion arises. Hence it is a good plan to have printed notices affixed to each bed to ensure that all inquiries are addressed to the sister-in-charge. Our notice is as follows:

NOTICE

You, the parents, and we in the hospital are working together to make your child well.

We believe it is good for the child to have you visit whenever you desire.

You will see all that is done for the patient.

If there is anything you wish to criticise or if you have any suggestions for improvement please speak to the Sister-in-charge. We welcome such suggestions.

If you wish to know anything about the child do not ask the nurse. Ask the Sister-in-charge.

It will be obvious that the success of this régime depends almost entirely on the personality, tact, and understanding of the sister-in-charge. She must have a real love of humanity and be prepared to take frequent interruptions cheerfully. She must also be a continual source of help and comfort. Where this is given willingly and generously it is reflected in the psychological climate of the ward.

The success of our scheme is, we think, shown by the fact that during the eight years we have had only two children taken from hospital against advice.

One was the child of an incompatible marriage, in which the parents were at loggerheads and the child was made the chopping-block of the dispute. The second was a child convalescent from nephritis who had been told prematurely by a resident medical officer that she could go home. When it was later found that the child required to stay longer in hospital the parents removed her at their own risk.

Conclusion

Our experience has convinced us that unrestricted visiting is good, and that by it we minister to the emotional needs of the child in his enforced unnatural institutional environment. It is of benefit to the child's physical condition and it reduces the risk of psychological injury.

It is a pleasure to acknowledge the debt we owe to Miss E. Schafer, matron of the hospital. Without her generous coöperation and sympathy this experiment would not have been possible. We have availed ourselves freely of her wisdom and the maturity of her knowledge in the nursing profession.

Medicine and the Law

A Broken Needle

A FIFTEEN-YEAR-OLD schoolgirl developed a blister on her heel which became septic. She went to a hospital clinic and a doctor advised an injection of penicillin. The girl was told to sit on a form and while the nurse was giving her an intramuscular injection, using a no. 16 needle, the girl made a sudden movement and the needle broke and remained embedded in her thigh. The needle was $^{30}/_{32}$ in. long and broke $^{1}/_{32}$ in. from the mount. An operation to remove the needle was successfully performed and there was no remaining disability except for a $3^{1}/_{2}$ in. scar on the thigh. The girl, through her father, brought an action alleging negligence against the borough council (who were in occupation and control of the hospital) and the nurse.

Mr. Justice Pearson said that the question was whether the accident was caused by any negligence on the part of the nurse for whom the hospital were vicariously liable. There was nothing wrong with the method used by the nurse, but it was said that she had used too short a needle and had pushed it in too far. The plaintiff's expert witness thought that it was wrong to use a no. 16 needle; he would have used a no. 2 which was longer and thicker and therefore presumably stronger. The defendants' expert witness thought that the selection of the needle and the method used were both right. The plaintiff's theory was that the needle must have been pushed in right up to the hilt before it broke, while the defendants' theory was that it might very easily have been pulled in. All that was highly conjectural. He, his Lordship, was faced with the fact that the needle broke very suddenly. If a longer and thicker needle had been used it would cause more pain to the patient, and he would think that if one inflicted more pain it would be more likely to cause a convulsive reaction. He, his Lordship, was not satisfied on the evidence that the needle was pushed in too far, and he thought that a nurse with the defendant's experience would not have pushed it in further than the right distance. The infrequency with which this kind of

accident occurred had to be borne in mind, and all that was asked of nurses was that they should use reasonable care. The accident could be explained as being due to an unexpected movement on the part of the girl; that was not the kind of thing which could reasonably be foreseen and therefore it would not be right to use a thicker and longer needle and inflict extra pain on all patients to meet the possible contingency that one of them might flinch in the way this girl did. There was no negligence and there would be judgment for the defendants.

Marchant *v.* East Ham Borough Council.—*Queen's Bench Division*: Pearson, *J.*: Oct. 10, 1955. Counsel and Solicitors: J. G. K. Sheldon (Churchill, Clapham & Co.); G. R. F. Morris (Blount Petrie & Co.).

C. J. ELLIS
Barrister-at-Law.

Parliament

The Budget and Hospital Building

PARLIAMENT reassembled on Oct. 25, and the following day Mr. R. A. BUTLER, the Chancellor of the Exchequer, introduced his autumn budget. In announcing that Government lending to local authorities was to be checked and that other public authorities were to be asked to coöperate in restraining both current and capital expenditure, he added that the Minister of Health and the Secretary of State for Scotland were communicating with hospital boards in this sense. In the hospitals, as in the local-authority services, the Government were not reducing the programmes which had already been announced; but, subject to that proviso, they were asking the hospital boards to ensure that only the most urgent and necessary works were undertaken.

In the course of a hard-hitting debate Mr. HAROLD WILSON suggested that because the Chancellor refused to cut inessential building in the private sector, he had been forced to impose a savage cut on the social services. Petrol stations, pubs, and cinemas were going up, yet council houses and hospitals had to be cut. City offices were mushrooming, yet schools had to be cut.

Mr. BUTLER: I have said that the hospital programme is going on as announced. I have made no statement that hospitals will be cut.

Mr. WILSON: The Chancellor has made it plain that the hospital authorities are asked to review capital expenditure.

Mr. BUTLER: I am referring to the hospital building programme. May I say that no new hospitals have been built since the war. It has been a source of pride to us that we have been able to keep our undertaking to maintain the education programme and also to start on a modest new hospital programme, which will be a very good thing for the country.

Mr. WILSON: That was in the programme announced in March and April. A lot of things have happened since March and April. Will the Chancellor give an assurance that there will be no cut in National Health Service expenditure, or on capital investment in hospital building?

Mr. BUTLER: I will adhere to the statement I made on July 26 and the statement I made in the course of my Budget speech. As I have said, the Minister of Health has communicated with regional hospital boards about capital expenditure which is not of the first priority.

Mr. WILSON again asked for an assurance that there would be no cuts in expenditure on building for the hospital service. Did the Chancellor, he continued, really think it a higher priority to build petrol stations and public houses than hospitals at the present time? If he really wanted to "blow off the froth," the Government should reintroduce building licensing and cut out the inessential building which was going on today, so that essential building could take priority.

At the end of the debate the PRIME MINISTER stated that the hospital building programme was not to be cut.

Replying to later questions, Mr. IAIN MACLEOD, Minister of Health, said the hospital-building programme which he had announced for 1956–58 in two statements, one in February and one in July, stood in respect of every hospital, ward, and bed. There were other programmes of regional boards and a period was now being entered upon when building would be twice as much as that undertaken by the Socialist Government. He had thought it right to write to all the chairmen and to assure them that the allocations were not being cut; nor was there any change in the special undertakings in regard to Whitley awards, and so on. But, in view of the Chancellor's decision, Mr. Macleod regarded it as the duty of everyone to do everything they could to see that the moneys available were not wasted. Preparation of the hospital building plans was proceeding but no building was due to start under the expanded programme before April 1, 1956.

Mr. KENNETH ROBINSON asked why only 8% of the centrally financed capital programme was being devoted to mental hospitals in view of the urgent need for additional beds and for the reconstruction of existing mental hospitals.

Mr. MACLEOD: It is true that this percentage is considerably less than the amounts devoted by hospital boards to mental hospitals, which have been steadily increased in recent years. But the centrally financed programme deals only with major projects and does not include the large number of small extensions and improvements that are being carried out. As regards the building of mental hospitals, it is true that none had been built for 20 years. That adds to my delight in being able to start them.

Viscount Malvern

On Oct. 26 VISCOUNT MALVERN of Rhodesia and of Bexley in the county of Kent, F.R.C.S. (formerly Sir Godfrey Huggins), prime minister of the Federation of Rhodesia and Nyasaland, was introduced and took his seat in the House of Lords.

QUESTION TIME

Hospital Visiting-hours

Replying to a question, Mr. MACLEOD said that, at the end of 1954, 506 of the 1362 hospitals admitting children did not allow daily visiting. On the advice of his Standing Medical Advisory Committee he proposed shortly to send hospital authorities a further memorandum on the subject. He would do everything he could to encourage visits by children to their parents and relatives who were sick in hospital, but it was a matter which must be left to those in charge of hospitals and not one on which he would issue an absolute direction.

Cost of Drugs and Appliances

Replying to a question, Mr. MACLEOD said that discussions about the method of fixing the prices of proprietary preparations had continued. Proposals which had been framed by representatives of the industry had recently been revised by them in the light of these discussions, and he was at present examining in detail the revised proposals. With regard to standard drugs and the main types of surgical dressings, investigations of manufacturers' costs and profits in both these fields were concluded earlier this year, and he was satisfied that there was at present no call for intervention by the Government. Basic drugs, which could not be dealt with separately from proprietary preparations, were still under investigation, and meanwhile the firms themselves had continued to reduce the prices of some important drugs. Since the price reductions to which he referred in his reply on June 17 last, he understood that the manufacturers had further reduced the prices of many penicillin products by about $12\frac{1}{2}\%$, of streptomycin products by about 15%, of chloramphenicol products by $2\frac{1}{2}\%$, and of a number of hormone products by varying amounts ranging up to 50%.

New Hospital for West Scotland

Replying to a question, Mr. JAMES STUART said that although the new hospital at Alexandria was built primarily as a reserve of accommodation for civil-defence purposes, arrangements were now being made and staff recruited to bring the hospital gradually into ordinary use from Dec. 1. Finance was being provided from the sum available for expansion of the hospital service in the current year, partly by diverting funds originally allotted to another board which was not at present in a position to apply them to projects of equal importance.

Public Notification of Executions

Mr. MARTIN LINDSAY asked the Home Secretary whether he would introduce legislation to provide for the date and place of executions not to be made public until after they had taken place.—Major GWILYM LLOYD-GEORGE: I do not think that it would be right to refrain altogether from announcing the date and place of an impending execution,

but I have noted for legislation at a convenient opportunity the recommendation of the Royal Commission that notice should be given in the press instead of by posting outside the prison gate.

Schools for Handicapped Children

Replying to questions, Mr. DENNIS VOSPER, parliamentary secretary to the Ministry of Education, said that excluding replacements, 11 new special schools had been opened so far in 1955. None of these was specifically for physically handicapped children. Several schools for spastics were in the current programmes, and by 1958 there should be no need for any spastic child to be kept out of a special school. For the more severely handicapped spastic he was sure that the special spastic school was the right answer; but for the less handicapped, the ordinary school for the physically handicapped would, he believed, be adequate. In December, 1954, local education authorities reported that nearly 19,000 children were awaiting places in special schools, of whom over 12,000 were educationally subnormal. Most of these children were being educated either in ordinary schools or at home.

Milk Tablets for Schools

Replying to questions, Mr. VOSPER said that 17 local education authorities were providing either dried milk or milk tablets, with the approval of the Minister, to 96 schools, for which they had been unable to make satisfactory arrangements for the supply of fresh milk. There was no suggestion that milk tablets were as good as liquid milk, but they were an adequate substitute. There has always been a number of schools which on account of their remote situation had been unable to get a supply of liquid milk.

Public Health

Ammonia against Smog

FOLLOWING investigations by the atmospheric pollution section of the Fuel Research Station, experiments are being carried out this winter on a possible method of combating the sulphur acids in smog. The method consists of releasing small quantities of ammonia to neutralise acids in the air.

During the great fog of 1952 a number of prize cattle died at the Smithfield show, in spite of improvised methods to save them, such as breathing-masks soaked in whisky; but no pigs or sheep died at the show. The prize cattle were kept in scrupulously clean quarters and under the most hygienic conditions possible, while the pigs and sheep lived in more natural surroundings. It was possible that the ammonia gas given off from the pigs' and sheep's litter mixed with the air they breathed with beneficial effect. This possibility pointed to the use of ammonia as a means of preventing damage to human lungs by acid vapours, particularly those in smog.

The atmospheric pollution section is coöperating with St. Bartholomew's Hospital, London, where outpatients and some medical staff have been provided with a bottle containing a solution of ammonia. This is rather like a chlorophyll deodoriser wick and bottle. During a smog the wick is pulled up and ammonia is released into the atmosphere of the room. The proportion of ammonia must be exact enough to neutralise the acids, so a special indicator paper is used to record the acidity of the atmosphere.

Poliomyelitis

Uncorrected notifications of poliomyelitis in England and Wales in the week ended Oct. 22 (42nd week) showed a slight decrease in the total number of cases; but there was an increase of 21 in paralytic cases. The figures were (41st week in parentheses): paralytic 210 (189), non-paralytic 137 (177), total 347 (366). Thus, the proportion of paralytic to non-paralytic cases was very much closer to the normal. The total uncorrected notifications in the 42nd week during the past six years were (percentage of paralytic cases in parentheses): 1950, 278 (70·9%); 1951, 119 (56·3%); 1952, 120 (71·6%); 1953, 136 (65·4%); 1954, 62 (62·9%); 1955, 347 (60·5%). So far this year the proportion of non-paralytic cases in England and Wales has been approximately 45·9% of the total. The figures for the whole of the preceding four years were: 1951, 41·5%; 1952, 29·8%; 1953, 34·6%; 1954, 32·8%.

In England Now

A Running Commentary by Peripatetic Correspondents

IN our department we don't worry about calendars or solstices or any new-fangled nonsense like that: our winter begins when Ernie says it does. Ernie is the chap who works the furnace, and the only man who understands our complicated heating system. If we are in early enough on the great day we are privileged to hear a great tone-poem in sound. A vast roaring noise begins somewhere in the basement and gradually builds up into a high-pitched scream as it sweeps its way through the lower reaches of the building. By the time it has reached the lab below our eyrie the pipes around our walls have started to shake with excitement, and the scream gives way to a series of titanic hammer-blows which lift our typewriter off its perch and send our reprints flying. Eventually the tumult quietens to a steady ticking noise, and when we stretch our legs under our bench we find that the radiator is red hot. Winter has come.

This time, however, winter did not come so smoothly as usual. The hammer-blows stopped on the second storey, and our radiator remained obstinately cold. We felt it necessary to inform Ernie of the hitch in his plans, and he honoured us with a personal visit. The consultation left us a trifle uneasy. It appeared that there was cement in one of the valves controlling our radiator, and it was a miracle that we had not blown up long ago. Ernie retired to the basement to shut off winter while the affected valve was dealt with, and when he came back we got under the bench with him to inspect the outrage. It was then that we noticed another valve on the pipe, hidden in an inaccessible corner, and asked Ernie what it was for. "Oh," said Ernie carelessly, "that's a by-pass for Biochemistry; you're first on the circuit here, and if that's shut they get no heating."

This dangerous information has been in our possession for some time now, and our baser impulses are simmering. We have a spanner from the workshop in our drawer, and only yesterday the Professor of Biochemistry spoke harshly to us when we backed into his car. It is exceedingly cold, and Ernie is on holiday.

* * *

In the Cameroons names are splendid in variety and rich in imagination. Fineboys and Freeboys are common and hardly worthy of inclusion in a collector's list. Culinary specimens, such as Sunday Curry and Mango Jam, financial ones such as Money Hard and German Money, and exhortative specimens like Mantry and Try Yourself vie with descriptive specimens such as Jolly Boy, and medical specimens, of which M & B is a good example. We are hoping that among the babies born in the hospital we will soon have a Penicillin if not an Achromycin.

* * *

Faced with the problem of removing a Foley catheter, the balloon of which refused to be deflated by the usual channel, we first applied to the Old Man of the Ward who had lately successfully removed his own with balloon fully inflated and without apparent trauma. Unfortunately he was flat on his back in a tranee and unable to supply any information.

We anæsthetised the patient in the theatre and fell to theorising.

Obviously, extreme inflation ought to burst the balloon. This had already been tried, albeit timidly, and followed up by sodium iodide. X-ray showed the balloon distended with several irretrievable ounces. The bladder was of small capacity, owing to prolonged drainage, and further inflation might distend the bladder thus protecting the balloon and laying the former open to the fate intended for the latter.

Bimanual palpation elicited an elusive tumour, and attempts at compression were met by successful evasion.

A ureteric catheter stilette insinuated along the passage towards the balloon's interior failed to reach its destination.

Total insertion of the Foley catheter on the end of a cystoscope followed by diathermy was suggested. "Rubber's a non-conductor," objected the Consultant drily; "Nip it with the biopsy forceps," said the Registrar; "Suprapubic acupuncture," volunteered the H.S., whereupon a spate of hydrostatic hypotheses circulated.

We eventually agreed that the pressure in the bladder—however high—would always be less than that in the balloon by the amount due to the elasticity of the rubber. Therefore, any puncture hole, due to a fortunate aim, would empty the balloon into the bladder. Q.E.D.

Meanwhile the Consultant was examining the Foley which, to his surprise, he had withdrawn *per vias naturales* with the balloon still inflated and without apparent trauma.

We went back to the ward. The Old Man was lying in the left lateral position in a state of natural sleep. There was the slightest suspicion of a smile on his peaceful face.

* * *

The entrance fee to the zoo was more than we thought, but it would be worth it to see six-year-old Jennifer clapping her hands with joy when she saw the animals.

We had a look at the monkeys first. "I know what I'd like," said Jennifer. "What's that?" "An ice-cream." We all had ice-creams.

"Now for the bears. Look at that little one, Jennifer—like your Teddy isn't he?" "Yes, and I've got nine teeth and I'm only six years old."

We tried the aquarium. Jenny's face lit up "From down here," she said, "you can see a rainbow if you look up into that corner."

"What would you like to see now?" "I want to run up those steps and down the other side." These were the steps used for helping children on to the elephant. "If you wait until the elephant comes back from his tea, you could have a ride on his back." "Can't I just run up those steps and down the other side?"

The next day we wondered how much had stuck in her mind of her visit to the Zoo.

"Where did we go yesterday, Jenny?" She wrinkled her brow and chewed the end of her spoon. "To the seaside," she exclaimed triumphantly.

So we spent the day quietly in the garden and Jenny made mucksie-pies. She had the time of her life.

* * *

At 8.30 A.M. on a Thursday our lecture-room usually resounds to the noise of Mrs. Mop's electric polisher, but this morning it was silent. No lecturer had appeared, no students had clumped down the corridor, but from a low murmuring within it seemed that the anæsthetics lecture had begun. There is a side-door with a porthole. I looked in.

To an audience of two—her cronies from the wards—our cleaner was demonstrating the projector with the skill born, it was evident, of long practice. On the screen was the lecturer's introductory slide, Dürer's woodcut of the first surgical operation under anæsthesia. "And the Lord God caused a deep sleep to fall upon Adam, and he slept: and He took one of his ribs, and closed up the flesh instead thereof; and the rib, which the Lord God had taken from man, made He a woman, and brought her unto the man."

How did this primitive masterpiece strike these elderly cinema and television fans? Giggles? Sniggers? There were none. The audience was rapt. As I regretfully opened the door the audience rose and the meeting came to a dignified, if hurried, close. But the spell was not broken. A wispy old dame smiled up at me as she grasped her broom. "'e done it lovely!" she said.

* * *

The Thoracic Surgeon sat in state behind a large desk, with his secretary at his elbow, and held a follow-up clinic on some of his patients whose mitral stenosis had been treated by valvotomy. Onlookers were impressed by the gratifying results, but the pleasant atmosphere was a little marred by a blue panting woman who took at least two minutes to reach her chair from the door. But finally she was settled.

"Now, my dear, how have you been since your operation?" he asked.

"Well, Sir, ——"

"Put that down, Miss Jones, put that down," he cried.

Letters to the Editor

CHEST PHYSICIANS

SIR,—With the recommendation of the Strachan Committee under consideration, we believe there is still widespread concern among chest physicians concerning their future prospects in the National Health Service. Data published in your journal earlier this year,[1] disclosed that in no other branch of specialist medicine have so few of the senior staff been graded as consultants, and what is even worse, in no other branch is the *establishment* fixed for such a low proportion of consultant rank. It is true that before the N.H.S., tuberculosis had, unfortunately, become divorced from other chest medicine, and its specialists were expected to have a higher qualification in the public-health field rather than in general medicine, but the treatment meted out to some of these senior colleagues by the grading committees was surely harsh indeed. Furthermore, many who have entered the specialty in more recent years have fared no better, in spite of the intensive training that has been demanded of recruits to the specialty since the inception of the service. It may now be claimed, with some justification, that of all the specialist medical fields, the practice of chest medicine comes nearest to that of general medicine in scope. What chest clinics today are only concerned with the management of tuberculosis patients? The management of patients seen at the chest clinic nowadays calls for the exercise of a wide range of diagnostic skill, and this is expected of the chest physician whether he be graded S.H.M.O. or whether he be graded consultant. Nearly every chest physician doing clinic work is accepting responsibility for the diagnosis and proper management of any patient suffering from any chest disease, and this is as it should be.

Very few indeed of these specialists graded S.H.M.O. do not hold either the recognised diploma in public health, which was the "open sesame" to the specialty in the past, or a higher degree in medicine which has now, perhaps rightly, supplanted the public-health diploma in this field, or else has shown by long experience that they have in fact the skill to carry such responsibility.

Why does this extraordinary exploitation of cheap doctoring persist so blatantly in the field of chest medicine? Would any reputable trade union tolerate such a state of affairs? It is, we believe, entirely due to the quite remarkable and unjustified bias held in certain, happily diminishing circles, against whole-time doctoring. A further contributory reason may even be that in certain authoritative, but not always well-informed, quarters, little (or nothing) is known of what goes on in a chest clinic—does one occasionally hear a distinguished leader of the profession refer to them as "dispensaries"?

The Ministry of Health, in receiving the Strachan report, is committed to increasing the consultant establishment in our hospitals. Without doubt, the diagnostic work in chest clinics, now that these have virtually become ordinary hospital outpatient departments (with inpatient accommodation under the same physicians), is going to increase substantially for at least another decade. Provided that the leaders of the profession realise the importance and variety of work now being done in chest clinics, it is difficult to see how the Ministry of Health can resist the recommendation for a very substantial increase in the consultant establishment in this specialty.

A. T. HENDRY
W. H. TATTERSALL.

Bournemouth Chest Clinic.

1. *Lancet*, 1955, i, 448.

MECAMYLAMINE IN HYPERTENSION

SIR,—In hypertensive patients under treatment with ganglion-blocking agents given by mouth, it is possible that some of the difficulties of management, such as irregular fluctuations of blood-pressure and gastro-intestinal atony, might be due to the poor absorption and, hence, large local accumulations of these drugs in the stomach and intestines. Stone and his associates [1] have reported recently that 3-methyl-aminoisocamphane hydrochloride (mecamylamine) is completely absorbed from the gastro-intestinal tract of animals. This facility of absorption is related to the fact that mecamylamine is a secondary amine, whereas all other effective ganglion-blocking agents have been tertiary amines (quaternary ammonium salts).

Hypertensive patients treated with mecamylamine in this clinic have shown an equal hypotensive effect whether the dose is given intravenously or orally. Effective dosages by either route in man have ranged between 2 and 20 mg. The duration of the hypotensive effect has been as long or longer than with pentolinium tartrate.

36 patients with severe hypertension have been given continuous treatment with oral mecamylamine for periods varying from one to four months. The blood-pressure was significantly reduced in every case although the range of effective dosage was wide, varying between 3 and 90 mg. per day (average 30 mg.). In comparison to the quaternary ammonium compounds there usually was less fluctuation in blood-pressure after mecamylamine, both at different times during the day and from one day to the next.

Mecamylamine, however, failed to induce any less degrees of constipation or gastro-intestinal atony. This suggests that these side-effects may not be due to large local accumulations of a ganglion-blocking agent in the gut but rather to the effect of the absorbed fraction on synaptic transmission in the ganglia. In addition, the ready absorbability of mecamylamine did not obviate to an appreciable extent the need for carefully adjusting the dose to fit the individual responsiveness of each patient.

In spite of these disappointments, mecamylamine, by reason of its complete gastro-intestinal absorption, seems to provide the reliability of parenteral injection with the convenience of oral administration. The drug, therefore, should prove to be a useful addition to the treatment of severe hypertension.

Georgetown University and the Veterans Administration Hospitals, Washington, D.C., U.S.A. EDWARD D. FREIS.

HÆMATOGENOUS OSTEITIS IN THE NEWBORN

SIR,—It is fortunate that most of the pædiatric surgeons throughout Europe now know one another very well. By visiting one another's clinics we have learned that although many of our problems are similar, some diseases manifest themselves in different ways in different areas. This may account for Dr. Neligan's "very different experience" in osteitis of the newborn (Oct. 22).

Once upon a time, I too was deluded into thinking that I had solved most of the problems of staphylococcal septicæmia. Perhaps further experience will alter Dr. Neligan's optimistic outlook in the unpredictable effect of the "unconquered staphylococcus" in the newborn. Dr. Neligan reports 34 cases with only 1 death. We were fortunate enough to treat 31 cases without a death but cases 32, 33, and 35 all died! Dr. Neligan aims to treat every case with "appropriate" antibiotics "until the bone infection has been completely eradicated." In the Glasgow series, case 32 died a few hours after admission, case 33 (case 5 in the article) died after seven weeks of continuous therapy with the "appropriate" antibiotics, and case 35 died of pneumococcal meningitis three weeks after discharge from hospital. At necropsy there was no evidence of active bone disease. The last patient in the series (case 41) apparently developed osteitis while under "appropriate" antibiotic treatment for a staphylococcal umbilical discharge. He died at the age of eight weeks after five weeks of continuous antibiotic therapy. It is perhaps unfortunate that we decided not to include in the article the table reporting all the "severe" cases in our series.

Apart from the small series reported from my own surgical unit, there have been many more cases in the other surgical and medical units of this hospital. I have also had the opportunity of seeing further cases in other children's units in Glasgow. While admitting that the mortality in the reported series is unusually high, the risk is there and few pædiatricians, obstetricians, or family doctors can afford to be happy about the effects of the unconquered staphylococcus in the newborn.

Royal Hospital for Sick Children, Glasgow. W. M. DENNISON.

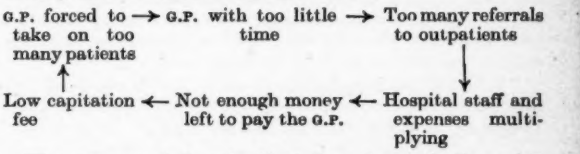
1. Stone, C. A., Torchiana, M. L., O'Neilly, G. P., Beyer, K. H. Meeting of the American Society for Pharmacology and Experimental Therapeutics, Sept. 7, 1955.

GENERAL PRACTICE

SIR,—Dr. Tait's letter last week was so realistic and stimulating that I would like to develop his arguments further.

The three requirements of good general practice which he so rightly says are lacking today—time, tools (including ancillary help), and training—could be fulfilled more simply than he suggests, without re-educating the politicians and without quartering the lists and quadrupling the capitation fee. Things could very largely be put right by the doctors themselves, within the service.

The vicious circle responsible for the present unsatisfactory state of affairs runs like this:


G.P. forced to take on too many patients
G.P. with too little time
Too many referrals to outpatients
Hospital staff and expenses multiplying
Not enough money left to pay the G.P.
Low capitation fee

The overcrowded outpatient department is the point at which this circle or spiral can be broken. Let the consultants and registrars exert a little kindly discipline on their general-practitioner colleagues and refuse to see outpatients without a proper letter sent in *before* any appointment is made. A minority of consultants do this already. This applies of course only to ordinary outpatient appointments, not emergencies.

Results would be salutary all round. General practitioners would have to take proper histories and examine patients before referring them to hospital. They would also find it helpful to employ secretaries to keep their records in order and to type the letters. An immense amount of time would be saved at outpatients and consultants would have a chance to plan ahead, seeing patients in roughly priority order and adjusting the appointments to fit the probable time required for each case.

Before long, the pressure on the hospitals would ease and their expenses would fall. There would then be more money to pay the family doctor for doing his work properly. Eventually the capitation fee might be doubled and the maximum list halved.

To prevent the G.P. suffering financial hardship during the transition period, perhaps an extension of the supplementary annual payment scheme, already in operation for doctors with small lists, might be introduced.

The family doctor could contract in or out of the new scheme, as he wished. If he came in, he would receive a grant for secretarial help, a training grant to enable

him to have regular postgraduate education, and a supplementary payment on a sliding scale related to the number to which he undertook to reduce his list by a specified date.

Richmond, Surrey. RICHARD MACKARNESS.

THE LUNGS IN MITRAL STENOSIS

SIR,—Dr. Steiner's letter last week refers to the small "horizontal lines at the periphery of the lung in the lower zones which are ascribed to distended lymphatics" and then implies that they are a feature of pulmonary hypertension.

The pulmonary œdema of phosgene poisoning in goats is associated with a large increase in the effluent from the thoracic duct.[1] Serum injected into the trachea of dogs is removed by the lymphatics.[2]

Whether these lines are due to enlarged lymphatics, or to interlobular œdema, it would be logical to assume that they are a feature of pulmonary œdema. Mitral stenosis is, of course, by far the commonest cause of chronic pulmonary œdema, and it is in this condition that they are most commonly seen. I have recently seen these lines in a patient with the nephrotic syndrome; they disappeared with the systemic and pulmonary œdema.

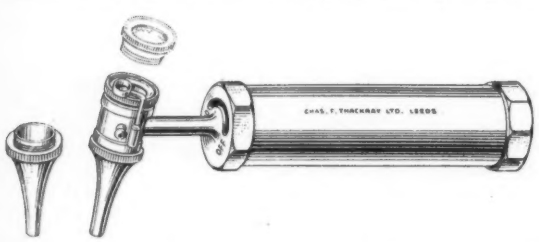
It would be helpful to know the "other conditions" with pulmonary hypertension and these lines to which Dr. Steiner refers. In particular, I would challenge him to produce an example of these lines in primary pulmonary hypertension without fluid retention.

Edinburgh. M. B. MATTHEWS.

AURISCOPE WITH FIXED HEAD

SIR,—With most auriscopes two very annoying faults develop before the instrument has been long in service: first, the light tends to flicker owing to faulty connection between the head and the battery handle; and secondly, the specula soon become loose in their attachment to the head of the instrument.

I have had an instrument made in which the head and the top of the battery handle are from a single casting. This unit is fitted to the battery handle by a quick-



running thread, and a retaining ring inside the battery handle prevents the batteries from falling out when the instrument is not assembled. The specula are fitted to the head again by a quick-running thread which prevents them from accidentally falling out or coming out of alignment. In addition the angle at which the head is set has been carefully adjusted to make it more convenient for the user when using the instrument as an "operating" auriscope; and instead of the usual three specula, five are supplied in graded sizes, the smallest being suitable for even the tiniest babies.

This auriscope has proved satisfactory in practice.

The auriscope is made by Messrs. Chas. F. Thackray, of Leeds.

West Hartlepool, co. Durham. F. FLEMING.

1. Cameron, G. R., Courtice, F. C. *J. Physiol.* 1946, **105**, 175.
2. Courtice, F. C., Phipps, P. J. *Ibid*, p. 186.

MODIFIED ELECTROCONVULSION THERAPY

SIR,—The article by Dr. Kelleher and Dr. Whiteley (Sept. 17) was of particular interest to us because we also have been investigating this subject.

We have confined our observations to the action of suxethonium bromide ('Brevidil E') in a series of male patients and we have used a standard dose of 50 mg. cation—that is, half that used by Dr. Kelleher and Dr. Whiteley.

In our cases (over 300 treatments to date) the onset of fasciculation has been slower than in theirs and we have not induced the convulsion until the phenomenon ceased—on average, 30 seconds after the injection.

During this interval restlessness, and in some cases distress, have been apparent in at least one third of the patients; subsequent amnesia, however, has been complete in all but a few cases. We consider the anxiety can be related to the longer interval between injection and induction of shock and intend to attempt to confirm this in a later series.

The degree of muscular relaxation achieved on our dosage has been considered adequate throughout the series.

Post-ictal apnœa has generally been shorter than in Dr. Kelleher and Dr. Whiteley's cases, and has on no occasion been so prolonged as to cause anxiety.

To sum up, our findings, compared with those reported by Dr. Kelleher and Dr. Whiteley, suggest that a smaller dose of relaxant can give adequate muscular relaxation and a shorter period of apnœa, but further investigation is required to determine the optimum interval between injection and induction which will avoid distress to the patient and give adequate modification of the fit.

J. K. HEWAT
J. G. JESSON
Knowle Group of Hospitals, Hants. DEREK S. G. M. BAILEY.

SIR,—My experience here with electroplexy runs parallel to that of Dr. Tyndel (Oct. 15). All workers in my own wards are unanimous that the effects of electroplexy are considerably more effective and lasting if there is no previous anæsthesia, as by thiopentone—that is to say, when the brain is not damped down.

For some time now, I have been using the three techniques side by side for comparison: (i) Straight E.C.T.; (ii) Modified E.C.T., using suxethonium bromide ('Brevidil E'); and (iii) Modified E.C.T., using thiopentone and suxamethonium chloride ('Scoline'). More and more are we inclined to abandon the use of preliminary anæsthesia except in the odd case.

The choice would then seem to lie between modified and straight E.C.T., and since the risks of straight E.C.T. have been greatly exaggerated, I think that (in view of the slightly added element of danger in the use of any muscle relaxant) straight E.C.T. should be our first choice if there are no serious contra-indications.

Over many years now, I have done thousands of "straights" without (touching wood!) any fatality: and, as Dr. Tyndel observes, the risk of bone complications is very small. The same applies to dislocations, always provided that proper precautions are taken—namely, adequate staffing, the proper holding of the jaw, an elastic hold on points of most "give" where shock is taken up (shoulders, knees, hip-joints, &c.), and adequate and early oxygenation.

Staff should be trained to hold these impact points with "firm gentleness," giving yet holding under the rebound of the convulsive state. It is my custom to start oxygen early before the convulsions have fully subsided, using a funnel in preference to the bag, which I reserve for the muscle-relaxant technique when the patient may not be capable, for a time, of breathing for himself.

If the jaw is properly held, dislocation will not occur. The most common fracture—a fracture of the dorsal spine—has been infrequent in our experience; and when the patient is held properly will seldom occur. When it does occur, we have not found any really serious consequences.

To be sure, you will always meet cases where straight E.C.T. cannot be undertaken—at any rate cannot safely be undertaken—as in the aged with brittle bones. Then, after ruling out straight E.C.T., *and only after*, one is faced with the alternative of anæsthesia or not. In such circumstances,

unless the patient was very apprehensive, my choice would be not. I would prefer to use some muscle-relaxant technique such as suxethonium *alone*; and I would prefer this even more emphatically when there are difficult veins. However skilful the administration of thiopentone, there is always, in certain cases, a risk of leakage from a vein. Much less has to be injected in the case of suxethonium. Thiopentone is irritating and any leak may cause inflammation or an abscess of the arm.

One must never forget—as one is sometimes inclined to do—that for *any* anæsthesia, even thiopentone, preparedness and availability of a full range of emergency equipment should be that of the most carefully planned surgical operation. This is not always possible at outpatients, or when a portable machine is taken to a patient's house. Nor is it always possible to find an anæsthetist available or willing to conduct the anæsthesia for routine electroplexies.

There is no escaping the fact that there is added risk to life with thiopentone, and it is this which has to be weighed against a supposedly greater risk to limb (and none at all to life) in the case of straight E.C.T. Can this be said even about modified E.C.T.?

Quite apart from the fact that results are so much better when E.C.T. is given straight, I know which I would prefer if I were the patient.

Exminster Hospital,
Exminster, Devon. JOHN W. FISHER.

EFFECT OF ADRENALINE ON ADRENOCORTICAL SECRETION

SIR,—The paper by Dr. Hunter and his colleagues [1] was a great help to me in the explanation of an important problem. The authors stated that the eosinopenia produced by adrenaline is independent of adrenocortical activity, the degree of eosinopenia found with a high plasma-steroid level being identical with that accompanying normal plasma-steroid values. In their view, it is the presence of adrenocortical hormones, rather than their elevated level, which is responsible for the eosinopenia of over 50% after adrenaline administration.

My problem is concerned with a study I have been making of the action of X rays on the sympathetic trunk. The procedure was first applied to the treatment of peptic ulcer by Nemenov.[2] I have confirmed his good results in 200 patients. In the course of this investigation I noted that healthy persons and patients with quiescent gastric ulcer reacted to each irradiation with a considerable eosinopenia; on the other hand, patients with an active ulcer showed much less change. Thus, an eosinopenia identical with that obtained by the corticotrophin or adrenaline Thorn test was observed in healthy persons. On the basis of the findings of Hills et al.,[3] I attributed this to the increased production of ketosteroid. Yet, the parallel estimation of eosinophil cells and ketosteroids after irradiation has shown that the eosinopenia was associated with an unchanged ketosteroid content of the urine. These results were controlled by the determination of the patients' serum-adrenaline by Trendelenburg's frog test—a test of debatable significance, but the only one available to me at that time. After 12 examinations yielding identical results, we concluded that, in the frog experiments, the serum of irradiated persons produced a pressure increase. From this we judged that the sera contained an increased quantity of adrenaline.

These results disturbed my explanation of the effect of irradiation and I was unable to form a definite opinion until the paper by Dr. Hunter and his colleagues clarified the apparent contradictions of my experiments. The action of irradiation on the sympathetic nerve may be explained as follows: irradiation produces, by a neurohormonal mechanism, adrenaline mobilisation. This is followed by eosinopenia, as after the administration of adrenaline. If the plasma-steroid level is normal, the eosinopenia will exceed 50%, while subnormal ketosteroid levels will be accompanied by an eosinopenia of less than 50%. Low ketosteroid levels, such as occur in the active stage of peptic ulceration, are never associated with an eosinopenia exceeding 50% after the adrenaline Thorn test or after adrenaline mobilisation due to irradiation.

Department of Rœntgenology,
Korányi Hospital, Budapest. MICHAEL FÓTI.

1. Hunter, J. D., Bayliss, R. I. S., Steinbeck, A. W. *Lancet*, 1955, 1, 884.
2. *Int. Congr. Radiol.* 1934.
3. Hills, A. G., Forsham, P. H., Finch, C. A. *Blood*, 1948, **3**, 755.

TREATMENT OF SHOCK

SIR,—We wish to reply to the letters by Dr. Powell and Dr. Buxton Hopkin (Oct. 15).

Dr. Powell wondered whether the possibility of fibrinogen deficiency was considered. In the original draft of our article we described the intravenous administration of 200 mg. of fibrinogen, which had no effect, 3¼ hours after the patient's admission to hospital. This was omitted in the shorter version that was published.

The first point raised by Dr. Buxton Hopkin with reference to the cardiovascular depressant properties of ether in the presence of adrenergic blockade is a valid criticism. However, we wonder if the degree of adrenergic blockade induced by an intramuscular injection of chlorpromazine (25 mg.) is clinically comparable to the conditions quoted in his letter as being those under which the danger exists. In any case the fall in blood-pressure at the stage under discussion did not occur during the induction of anæsthesia, nor yet after induction during the preliminary steps of the operation, but when the uterus was being packed. This procedure frequently does result in the patient becoming shocked, and we must re-affirm that we believe it to have been culpable in this instance.

We regret our apparent misrepresentation of Dr. Buxton Hopkin, as we are aware of his views on this subject. He has said, "Workers in this country and in France agreed that all the advantages claimed for the use of chlorpromazine in anæsthesia could be obtained without resort to hypothermia." [1] We wished to obtain the benefit of these advantages, but, as Dr. Buxton Hopkin said in his letter, "there is a danger of hyperthermia if these patients are overheated, and for this reason it is advisable to work in cool theatres."

Does this not imply a mild degree of external cooling? If a slightly greater degree of external cooling is applied, is it then necessarily a different type of anæsthesia?

We subscribe to the view that chlorpromazine has valuable properties in relation to shock and surgical aggression. In addition to facilitating the induction of hypothermia, chlorpromazine was given, as indicated above, to obtain the benefit of these properties. Hypothermia provides additional protection against the occurrence and/or the effects of anoxia, particularly in a case such as this, and is surely a further stage in the same process. It was on this reasoning that the references to poor-risk surgery and "this type of potentiated anæsthesia" were made. The danger of hyperthermia was emphasised in our paper.

With reference to the suggestion that hypothermia be omitted until the value of chlorpromazine has been assessed under normal working conditions, we were careful, although our patient survived, to avoid claiming that hypothermia was more than a supplement to orthodox resuscitation. Nevertheless, we have grave doubts about the outcome if hypothermia had not been employed in this case.

In the anæsthetic department of the Southern General Hospital, our interest in chlorpromazine is not solely in its relation to hypothermia. We are amongst those who are striving clinically to assess also the value of the drug itself in anæsthesia.

Southern General Hospital,
Glasgow. DAVID B. MURRAY
DONALD F. BRUCE.

1. Hopkin, D. A. B. *Proc. R. Soc. Med.* 1954, **47**, 617.

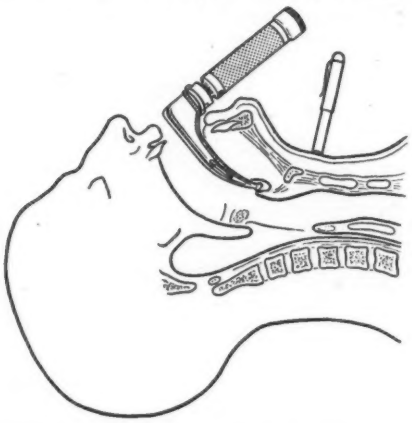
REGISTRARS

SIR,—When the situation of registrars is discussed, little or no attention seems to be given to the most important point—that they are "in training." It is apparently quite usual for a hospital management committee, observing that this is a "whole-time" appointment, to require a registrar to attend at the hospital daily from 9 A.M. to 5.30 P.M.; to be ready to stay on until 7.30 or even 10 P.M. whenever required; to be "on call" for emergencies one week in three, or so, which entails being at home and "on the telephone" (unpaid for, and not even allowed as income-tax expense), *every* evening and the whole weekend. Sometimes indeed he is required to sleep at the hospital—even to *pay* for doing so! And all this without any compensatory "time off duty." Management committees, it seems, are usually astonished when they are reminded that it is their *duty* to allow every registrar adequate time to attend courses of instruction, for reading, for research—even for "thinking"—as *part of the appointment*. Until these things are everywhere accepted, the whole purpose of a registrar's appointment is frustrated and he becomes merely a cheap substitute for a consultant.

Cambridge. E. WATSON WILLIAMS.

TRANSILLUMINATION OF THE LARYNX

SIR,—A common fault of most laryngoscopes—particularly those subjected to daily use—is failure of the light. This can be exasperating and dangerous when short-acting muscle relaxants are being used to aid intubation of the trachea. An accessory light shone over the anæsthetist's right shoulder will sometimes allow intubation to be carried out under direct vision. A satisfactory transilluminated view can, however, be obtained if a light (e.g., that of a fountain-pen torch) is shone on the larynx externally—even if the neck is thick. This observation was first recorded in 1859 by Czermak,[1] who



used sunlight concentrated by lenses and concave mirrors; but modern textbooks of laryngology make no reference to transillumination. For the brightest illumination the light should be directed through the cricothyroid membrane; but adequate transillumination is obtained through the upper two inches of the trachea.

Pressure of the torch on the larynx can facilitate intubation by pushing the larynx posteriorly. In the "difficult" patient this manœuvre brings more of the posterior commissure into view.

Using transilluminated light, a patient can be intubated under direct vision, with the aid of a tongue-depressor, a dessert spoon, or a shoe-horn. The head should be well extended and the tongue pulled out over the lower jaw as far as possible. Then, when the base of the tongue is pushed forward with the instrument, the larynx comes into view. It should be possible to intubate a patient requiring resuscitation, using household articles and a Magill endotracheal tube.

Transillumination of the larynx is now being used again as an aid to the diagnosis of disorders of the larynx.

1. Czermak, J. N. On the Practical Uses of the Laryngoscope. In New Sydenham Society, Selected Monographs, 1861, p. 17.

Anæsthetic Department,
King's College Hospital,
London. NORMAN TATE.

WARTS

SIR,—If, as your correspondents Dr. Lyell and Dr. Friedlander (Aug. 13) contend, warts, especially plantar ones, are spread by going barefoot on floors infected by warty feet, we in India should have the highest incidence of warts in the world. For here the vast majority of people go barefoot for various reasons, and on surfaces no better than dancing floors for that matter. But actually it is not so, showing that infection is not the only thing responsible for these nasty excrescences. Even if the infectivity theory were to be believed, what about the causative organism and the source of infection?

That warts are primarily a localised degenerative process of the skin of dietetic origin, with perhaps some superimposed infection, is borne out by the fact that they quickly disappeared in 5 of my patients, 3 of whom had plantar warts, after administration of methionine in doses of 1–2 g. daily, and maintenance of local hygiene.

Kanpur, India. KRISHAN K. KAPUR.

ABUSE OF ANTIBIOTICS

SIR,—A patient of mine, a man aged 32, was admitted to hospital with an accidental gunshot wound of the chest. There was no penetration of the thorax, only peppering of small shot beneath the left breast. Incision of the track was carried out and the report from hospital said that "primary healing has occurred with the help of penicillin intramuscularly for a week."

I wonder how much notice is taken, particularly by the younger doctors, of the warnings of the indiscriminate use of antibiotics and its possible future dangers in creating resistant strains. In your leader of Oct. 8 you stated: "It is desperately and dangerously wrong to abuse them as placebos, febrifuges, substitutes for diagnosis, and covers for imperfect methods of asepsis."

After all, primary healing of wounds used to take place without the use of antibiotics.

London, S.E.25. A. FRY.

EXPELLING TAPEWORMS WITH MEPACRINE

SIR,—I read with interest Dr. Seaton's article of Sept. 24. In my experience, too, mepacrine has been a success: 20 patients were treated and in 16 the complete worm was passed. In the remaining 4 most of the tænia, but not the scolex, could be demonstrated. Follow-up showed that in none of the 4 patients had proglottides reappeared.

A Ryle's tube was not used except in the first 2 cases. The dosage was 0·8—1·0 g. The tablets were given two by two every fifth minute with a little milk. 7 of the 20 patients had moderate nausea, but vomited either not at all or once only. 1 patient had intense nausea and vomited several times. Among the 8 patients with nausea was 1 of the 2 patients who had a Ryle's tube passed.

Opinions have varied about whether the duodenal tube is advisable or not. Sodeman and Jung [1] cured 11 out of 11 patients and Hernandez-Morales [2] 13 out of 24, without using the duodenal tube; whereas Hornborstel and Dörken [3] cured 20 men out of 20 and 13 women out of 23 after passing the tube. In my experience, at least, the omission of the tube has not decreased the success

1. Sodeman, W. A., Jung, R. C. *J. Amer. med. Ass.* 1952, **148**, 285.
2. Hernandez-Morales, F. *Puerto Rico J. publ. Hlth*, 1952, **25**, 78.
3. Hornborstel, H., Dörken, H. *Dtsch. med. Wschr.* 1952, **77**, 339.

of mepacrine, and to many patients the usually very moderate nausea when tablets are given with a little milk may seem preferable to having a tube passed.

Adequate purging is absolutely essential. I have had 1 failure with mepacrine after my report [4] was published. The patient was a mental defective with severe chronic constipation, and purging was ineffective.

With careful purging, mepacrine treatment should be just as practicable for outpatients as inpatients, if, as I believe, the tube can reasonably be omitted.

State Mental Hospital,
near Aarhus, Risskov, Denmark. OLE J. RAFAELSEN.

INVESTIGATION OF VIRUS INFECTIONS

SIR,—I was most interested to read Dr. Breen's plea last week for facilities for routine investigation of virus infections. It is extremely difficult to diagnose with certainty the many types of virus infection admitted to hospital, with the result that the guess of the general practitioner is as good as, if not better than, that of the consultant.

The standard of work in infectious-disease hospitals has improved beyond recognition in the past twenty years and one of the factors responsible is the ancillary work done by the laboratories; the need for a virus laboratory for routine work is urgent and we must do all we can to persuade those responsible that this project merits high priority.

In the meantime, let us pay tribute to those benign virologists working in private laboratories who are kind enough to undertake occasional investigations in exceptional circumstances.

St. John's Hospital,
Uxbridge, Middlesex. E. VIVIAN LAMBERT.

INFECTION ACQUIRED IN HOSPITAL

SIR,—Dr. Colebrook is to be congratulated on his interesting article last week.

I agree with his suggestion that an infection-control officer should direct and coördinate all the activities which make for safety from infection in hospital.

His suggestion that "there will of course be difficulty at first in finding suitable officers," &c., implies that he has overlooked the one person in each area who can claim to have the necessary qualifications for the job—namely, the medical officer of health.

I would suggest with all respect to such a distinguished expert as Dr. Colebrook that the failure to control infection, and indeed to recognise its magnitude, has been due in some cases to the firm refusal by hospital authorities to act upon the suggestion contained in a circular issued by the Ministry of Health many months ago that they should form a control-of-infection committee on which the medical officer of health should serve.

In other instances the medical officer of health has been given neither the necessary authority nor information to investigate and deal with problems of infection. Many of your readers must have witnessed the narrow approach to these problems made by experts in other fields—e.g., the concentration on sterilisation of bedpans and urine bottles by the surgeon, the stress laid on the plate-count by the bacteriologist, &c.—while other lines of approach have been almost completely neglected.

I am convinced that until the medical officer of health, who can take a broad view of the problem involved, is brought into the picture we shall still have no answer to the wise observation of Dr. Colebrook that "hospitals have unfortunately been the places in which grievous harm has frequently been done to a great number of people."

J. ADRIAN GILLET
Dagenham, Essex. Medical Officer of Health.

4. Rafaelsen, O. J. *Ugeskr. Læg.* 1955, **117**, 54.

DEATHS AFTER ANÆSTHESIA

SIR,—Your annotation of Oct. 22 correctly stresses the fact that the patient must never be left unobserved for a moment and that suction should be immediately available.

It is true that patients are sometimes inadequately supervised. At night a busy surgical ward often has a proportionately smaller staff who have to guard their patients in semi-darkness. During the day the task is easier, but the increased staff has more duties to perform. However, many hospitals have only a limited number of skilled nurses available, and it is unlikely that ward routine could be altered to provide the suggested unremitting vigil.

Suction is of value in the treatment of some patients who have vomited, but often the vomitus is solid. In this circumstance suction is of little help. The provision of suction devices immediately available for every contingency would be expensive in installation and maintenance, and of limited value.

The idea of a recovery-room for postoperative cases is not new. Its presence will enable a skilled staff to supervise these patients in a satisfactory light. If it is near the theatre, an anæsthetist might be available for an emergency. The room need not be large, for patients usually recover consciousness fairly rapidly, and can then be taken back to their wards. With slight reorganisation it is possible that no extra nurses would be needed, and the purchase of large quantities of equipment would be avoided.

St. Albans. J. W. R. MCINTYRE.

SIR,—I would like to support Dr. Hex Venn's plea last week for the provision of a postoperative observation ward close to our operating-theatres. Such a ward can certainly be life-saving, staffed as it is by highly trained nurses equipped with apparatus for suction and intravenous therapy, and with really good illumination. But surely the position in this country is not quite so black as Dr. Hex Venn paints it. At the Southend General Hospital we have a six-bed postoperative observation ward very close to the twin theatre suite, and I have seen similar rooms in several other hospitals.

Southend-on-Sea. J. ALFRED LEE.

NUCHAL-BULBAR HÆMANGIOMATOSIS AND ENCEPHALO-FACIAL HÆMANGIOMATOSIS

SIR,—There can certainly be no doubt as to the great frequency of "nuchal nævi," which are superficial telangiectatic vascular nævi of the nape of the neck, often more or less hidden by the hair of the scalp.[1–4]

Sklarz [4] refers to the early description by Unna in 1896. It seems that the number of adults affected, though very large, would be much greater if it were not for the fact that in many infants the nuchal nævi disappear spontaneously in early childhood.

The question with which I am concerned is whether nuchal nævi may ever be accompanied by a hæmangiomatous condition in the bulbar region (brain stem), thus constituting a condition of nuchal-bulbar hæmangiomatosis, analogous to encephalo-facial hæmangiomatosis (Sturge-Weber-Kalischer disease).

The observations of Shafar and Doig [2] suggest that a condition of this kind does occasionally occur, but I could not find any supporting evidence, until Dr. Macdonald Critchley kindly informed me of a paper published recently in Paris in the volume dedicated to Dr. André Thomas.[5] Krabbe describes the case of a man of 55 with a nuchal vascular nævus and bulbar

1. Bettley, F. R. *Brit. J. Derm.* 1940, **52**, 363.
2. Shafar, J., Doig, A. *Brit. med. J.* 1955, i, 913.
3. Dixey, J. R. B. *Ibid*, p. 1032.
4. Sklarz, E. *Ibid*, p. 1221.
5. Krabbe, K. H. *In* Jubilé du Docteur André Thomas. Paris, 1955; pp. 189, 192.

nerve symptoms (apparently developmental). This may be considered as a possible genuine example of nuchal-bulbar hæmangiomatosis, for which I was searching.

London, N.W.1. F. PARKES WEBER.

PLASMA-INSULIN ACTIVITY IN DIABETES MELLITUS

SIR,—In Dr. Vallance-Owen's absence, we should like to reply to Dr. Edwards's letter of Oct. 8.

Though, in their article of Sept. 17, Dr. Vallance-Owen and his colleagues enumerated evidence for the similarity of what they assay to insulin, it is of course true that the plasma activity measured has not been proved to be insulin. But, since it is measured against an insulin standard and has many attributes in common with insulin, "plasma-insulin activity" seems an appropriate description. In bio-assay parlance, "insulin-like activity" means the sum of the effects of the substance concerned, its antagonists and its synergists. That the proof is not absolute applies equally to very many biological assays and Dr. Edwards's objections to calling this assay "insulin" would apply to the identification of the substance in many bio-assays.

Postgraduate Medical School of London, W.12, N. W. PLEASE
RUSSELL FRASER.

SIR,—The results of our investigations completely agree with the view expressed by Dr. Edwards in his letter. For a long time we have been studying the influence of insulin and glucagon on the glucose uptake of the isolated rat diaphragm and estimating the insulin effect of plasma in this test. The plasma of pancreatectomised dogs, which theoretically has no insulin, has in fact some insulin effect. This effect does not disappear with the addition of cystein. When cystein is added to the plasma in sufficient quantity to destroy the insulin it theoretically contains, the insulin effect continues.

We agree, therefore, with Dr. Edwards that the effect H is not the same as effect I.

JOSÉ LUIS R.-CANDELA
R. R.-CANDELA
J. ROVIRA
Instituto de Metabolismo y Nutrición, Madrid. Y. VALLADARES.

A NEW DESIGN OF SYRINGE

SIR,—I was most interested in Dr. Camber's ingenious syringe (Oct. 15) which utilises the hollow plunger as a reservoir. By incorporating an attachment at the end of the handle of the plunger, or to one side of it, to take the rubber tubing from an infusion set, dispensing with the hole and groove A (see Dr. Camber's diagrams), this syringe could be used for delivering intravenous fluid under positive pressure in the following way:

By driving the plunger home, aligning hole B in the plunger with groove B in the barrel, and holding the syringe with the nozzle upwards, the reservoir would fill with fluid, expelling all the air. By twisting this nozzle out of alignment the syringe may now be used in the normal manner for inserting the needle into a vein. Once this is achieved the groove and hole are re-aligned. The positive pressure in the infusion system will then force the plunger outwards to its limit (a chain will be needed to restrict further expulsion). By disaligning the groove and hole, fluid can now be injected. The special tap and needle described in Dr. Camber's syringe are not needed.

This syringe would be useful in children as an improvement on the popular Kaufman syringe, but it might also find a place in anæsthesia by incorporating it in the tubing of the infusion apparatus some distance from the limb. It could then be used for controlled positive pressure administration of fluid.

Royal Manchester Children's Hospital, Pendlebury. M. A. KIBEL.

HYDROCORTISONE IN PAINFUL SHOULDER

SIR,—On reading this discussion in your columns, I find two matters that seem to me inadequately stressed.

One relates to diagnosis: a proportion of these cases show a not inconsiderable degree of cervical spondylosis with associated nerve-root irritation. I feel that in such cases, Dr. Cyriax's criteria of examination will not lead to diagnosis of the condition.

The other is in treatment: in a fair number of patients with painful subdeltoid bursitis, a varying amount of effusion is present in the bursa. Aspiration of 15 ml. of fluid presents little difficulty, but removal of a small amount is another matter. It is of little use, however, to inject 1 ml. of hydrocortisone or anything else, if it is immediately diluted by two or three times its volume of mucous fluid.

Sunderland. W. GRANT WAUGH.

AN INCOMPLETE VICTORY

SIR,—The night after reading your leading article of Oct. 22 I was called to see a colleague's patient in a common lodging-house and, as on a previous visit this year, was confronted by a known case of tuberculosis with a productive cough. I do not know if this particular patient was sputum-positive, but I think there can be little doubt that many infected patients, whether diagnosed or not, do live in these lodging-houses.

This particular one has places for over a thousand inmates, two hundred of whom sleep on each floor in minute cubicles separated by partitions which do not reach the ceiling. Their main population seems to consist of migrant labourers, mostly Irish, and this intimate contact of infected old men and susceptible young adults presents terrifying possibilities.

On the same weekend, I was called to another known tuberculous case with a productive cough, living in a very crowded private lodging-house with eighteen inmates. It would seem that the provision of hostel accommodation for homeless patients with chronic tuberculosis could play a real part in completing the victory.

London, N.W.5. ANTHONY RYLE.

DOSAGE OF CORTICOTROPHIN

SIR,—With reference to Dr. Leese's article of Oct. 22 and to other articles published and to be published in which the use of corticotrophin is described, I would like to make a plea that more information be given. In the article refe red to and in many others we were told that so many milligrammes of corticotrophin were given for so long. Corticotrophin is the name given to extracts of animal pituitaries that contain adrenocortical-stimulating properties. These extracts differ greatly in their potency per mg. and so should be prescribed in units and not mg. The method by which the manufacturers have arrived at their unit should be noted. Further the therapy given is that of adrenal stimulation and although the degree of adrenal stimulation given may very roughly correspond to the number of units of corticotrophin injected in the first week or two of treatment, it may later bear no relation at all. This is due to the ability acquired by many patients to destroy intramuscularly (or subcutaneously) administered corticotrophin and to the fact that one batch of corticotrophin may be more readily destroyed than another.

As things are, we can make no proper assessment of the value of corticotrophin therapy unless the adrenocortical stimulation produced and maintained has been measured. This can be done by repeated urinary assays of 17-hydroxycorticosteroids. At the present time a lot of money is being wasted in giving large doses of virtually impotent corticotrophin as maintenance therapy.

Sheffield Centre for the Investigation and Treatment of Rheumatic Diseases. H. F. WEST.

MUMPS MENINGO-ENCEPHALITIS

SIR,—Mumps as a cause of pyrexia with meningeal irritation is extremely difficult to diagnose when neither parotitis nor orchitis occur. In their article on mumps meningo-encephalitis [1] Dr. Wallman and Dr. Vidor have clearly shown the value of serum-amylase estimation in the diagnosis of the febrile child with mild meningeal irritation. The clinical diagnosis of mumps meningo-encephalitis in the absence of the more usual manifestations may be suggested by the presence of abdominal pain. In 10 cases of mumps in young adults, which I have seen recently, the serum-amylase levels were markedly raised in 6; of these only 1 experienced abdominal pain of any severity, while 1 of the 4 with normal serum-amylase levels complained of mild abdominal discomfort. Thus it appears that abdominal pain is infrequent and bears little relationship to the level of serum-amylase.

Dr. Wallman and Dr. Vidor comment on the "invariably normal amount of sugar and chloride" in the cerebrospinal fluid (C.S.F.). The following case illustrates that low levels of chloride and sugar may occur, and that changes in the C.S.F. may persist for a longer period than is usually realised. It is in precisely such a case as this that serum-amylase estimations may well have been of diagnostic value and obviated the frequent repetition of lumbar puncture.

A schoolboy aged 15 was admitted on Jan. 26 complaining of frontal headache, nausea, and repeated epistaxis for four days. On admission his temperature was 101·6°F, he looked pale and drowsy, and he had photophobia. The abdominal and lower-limb reflexes were absent, the upper-limb reflexes diminished, and the plantar responses normal. There was a coarse nystagmus on looking to the right, but no neck rigidity or Kernig's sign. Soon after admission he became very restless and confused, the temperature rose to 103°F and a further examination showed bilateral extensor plantar responses. Lumbar puncture was performed and repeated at intervals during his illness. He had previously been treated for chronic sinus infection, and as X-ray examination of the sinuses showed some opacity of the right antrum due to chronic sinusitis, an intracranial infection was suspected. Treatment began with crystalline penicillin and streptomycin and was continued for eight days.

On the day after admission (Jan. 27) he was still febrile and confused, and incontinent of urine. Next day he was mentally clear and the plantar responses were normal. The pyrexia persisted at levels of 100°–102°F until Jan. 31, although his clinical condition improved considerably. Intermittent pyrexia at lower levels continued for a further week (until Feb. 7) during which time the patient felt well. Thereafter he remained afebrile.

Investigations.—An electro-encephalogram on Jan. 31 showed a grossly abnormal record consistent with active generalised brain pathology but there was no evidence of any focal brain abscess. Blood-counts, urine examinations, X-ray examination of chest and skull, and Paul-Bunnell reactions showed no abnormalities, the Wassermann reaction was negative in blood and C.S.F., and repeated examinations of sputum and C.S.F. showed no tubercle bacilli. The C.S.F. findings were:

Date	*Cells (lymphocytes per c.mm.)*	*Protein*	*Chlorides (mg. per 100 ml.)*	*Sugar*
Jan. 26	322	45	..	65
Jan. 27	304	55	620	54
Jan. 28	415	90	640	53
Jan. 31	..	320	700	27
Feb. 3	483	240	660	71
Feb. 10	441	360	700	52
Feb. 17	164	240	660	55
Feb. 25	53	240	720	66
March 17 ..	29	120	740	71

Serum taken on March 1 was examined by the Public Health Laboratory, Monsall Hospital, Manchester, and found to be positive at 1/320 on complement-fixation test for mumps S antigen, consistent with a recent infection with the mumps virus. Further inquiries revealed that there were no cases of mumps at the patient's boarding-school prior to his illness, but that on the day he fell ill another pupil developed bilateral parotitis, and these two cases were followed by a small epidemic of mumps in the boarding school.

This case of mumps meningo-encephalitis showed a pyrexia for fourteen days, C.S.F. changes for at least seven weeks, and an initial reduction in the chloride level of the C.S.F. When faced with the common problem of a febrile child showing signs of meningeal irritation, an estimation of the serum-amylase and/or urinary diastase may well prove a valuable aid to diagnosis.

Hammersmith Hospital,
London, W.12. A. G. SHAPER.

1. *Lancet*, 1955, *1*, 1105.

ASTHMA, BRONCHITIS, AND EMPHYSEMA

SIR,—I have read with great interest Dr. Lister's article of Oct. 8. But I am surprised that he did not refer to the great benefit which infra-red and ultraviolet irradiation can give in these conditions.

Patients with asthma, bronchitis, and emphysema are unfortunately all too often referred to the specialist in physical medicine as a last resort. Yet the nasal catarrh or sinusitis which almost always precedes or accompanies these conditions can be effectively treated by intranasal and postnasal application of ultraviolet rays combined with general ultraviolet and infra-red irradiation. It is a great pity that medical students are taught so little of this subject—or indeed of physical medicine as a whole.

Eastbourne. W. ANNANDALE TROUP.

TRAUMA AND ADRENAL HÆMORRHAGE

SIR,—Your annotation of Oct. 22 does not provide a convincing explanation of this condition.

Anyone familiar with the work of Reilly [1] and Tardieu [2] in France on the effects of autonomic irritation will be impressed immediately by the fact that, in the series described by Levene [3] and Sevitt,[4] adrenal hæmorrhage was associated either with lower thoracic and upper abdominal injuries on the same side, or with intracranial damage in the region of the brain stem.

Hæmorrhage of the suprarenal can be produced experimentally in animals, not only by injecting small amounts of bacterial toxins, and chemical irritants directly into the splanchnic nerve, but also by simple injury. These lesions occur as part of the generalised non-specific responses which include hæmorrhagic lesions of the gastro-intestinal tract, and cardiovascular collapse indistinguishable from severe shock. Animals vary in their susceptibility. The lesions can be produced regularly in guineapigs, but less constantly in dogs.

When, however, irritants and sclerosing solutions are injected into the brain stem of dogs, death rapidly occurs associated invariably with the same non-specific lesions, and cardiovascular failure.

It is surprising therefore that these well-established facts have not been considered in attempts to explain suprarenal hæmorrhage following injuries in which the splanchnic nerve or brain stem is involved. It is possible that most of Sevitt's cases and all of Levene's could be explained either as the result of irritation and damage to the splanchnic nerves on the same side of the adrenal hæmorrhage, or to disturbance of autonomic centres in the brain stem. Certainly so far as Levene's account is concerned, both Reilly and Tardieu agree that this offers a rational explanation.[5]

This is far from being an academic question. If the adrenal lesion is part of a generalised non-specific response to trauma then the adrenocortical failure (if it occurs) is a secondary manifestation, and in the first instance treatment would be better directed towards modifying or restraining the non-specific response as a whole. Both Tardieu and Reilly have shown that chlorpromazine *prevents* these non-specific responses in animals, but

1. Reilly, J., Rivalier, E., Compagnon, A., Laplane, R. *C.R. Soc. Biol., Paris*, 1934, **116**, 24.
2. Tardieu, G., Tardieu, C. Silvestre, J., Pocidalo, J. J. *Rev. Neurol*, 1950, **82**, 81.
3. Levene, M. *Lancet*, Aug. 13, 1955, p. 321.
4. Sevitt, S. *J. clin. Path.* 1955, **8**, 185.
5. Tardieu, G. Personal communication.

that neither cortisone nor corticotrophin have any preventive or curative properties.[6]

It is therefore more logical to explore the possibilities of prevention of the effects which follow severe injury by the use of chlorpromazine, than to treat with corticotrophin and adrenocortical steroids.

Lambeth Hospital, London, S.E.11. D. A. BUXTON HOPKIN.

ANTICOAGULANTS IN A HOT CLIMATE

SIR,—During the Egyptian summer, patients with coronary infarction receiving maintenance doses of phenylindanedione may bleed easily. This bleeding is due to (1) dilatation of peripheral vessels in hot weather, and (2) insufficient intake of fluids with consequent rise in the blood-level of the drug and reduction in the prothrombin concentration percentage.

During summer, these patients must be examined daily for any bleeding. The prothrombin-time and percentage must be determined every few days and when there is any bleeding. When bleeding occurs and the prothrombin concentration is below 10% of normal, the drug should be stopped and plenty of fluids given to help its excretion.

Suez, Egypt. ATTIA TAWFIC.

Obituary

JOHN BARKER NEAL
T.D., M.R.C.S., D.C.P.

Colonel J. B. Neal died at the Tidworth Military Hospital on Oct. 2, at the age of 43. Born at Whitby, Yorkshire, on Feb. 26, 1912, he was educated at Dulwich College and Westminster Hospital, from which he took the conjoint qualification in 1935. He became junior assistant pathologist to the Seamen's Hospital, Greenwich, in 1939. In 1930 he had joined the Territorial Army as an infantry officer; he transferred to the R.A.M.C. (T.A.) in 1938 and was embodied for service in the rank of captain just before the outbreak of war in 1939. He was promoted major in 1940 and served from 1942 until the end of the war in the Middle East mainly as a staff officer, passing a Staff College course in 1944. He was appointed to a permanent commission in 1945.

In 1947 he was promoted major and returned to the practice of pathology. After passing the senior course and the specialist course in pathology at the R.A.M. College in 1949–50, Neal assumed the appointment of demonstrator of pathology there. While at the college he was the second officer to take charge of the recently established Army Tumour Registry, and he was responsible for producing the report on its first five years' work. In 1952 he took over the editorship of the *Journal of the Royal Army Medical Corps*, which he retained until his death. He was appointed assistant director of pathology, Southern Command, in 1953, with the temporary rank of lieut.-colonel, and later that year assumed command of the David Bruce Laboratories. He was granted the temporary rank of colonel in February this year. He is survived by his widow and two young sons.

A colleague writes:

In the untimely death of John Neal the R.A.M.C. has suffered the loss of an outstanding officer. He was an excellent pathologist, particularly in the field of morbid histology, and the Army Tumour Registry owes much to his work. He was also most deeply interested in military history, with special reference to that of the Army Medical Services, on which he has written papers and delivered addresses. As an editor he was very successful, being accurate, painstaking, and the possessor of a scholarly literary style. He had all the qualities desirable in an officer, including sound judgment and a high capacity to exercise command and to assume responsibility. These attributes were combined with a most soldierly appearance and bearing. As a man he was courteous, kind, sociable, and the best of company. His loss will be keenly felt.

6. Reilly, J., Tournier, P. *Bull. Soc. méd. Hôp. Paris*, **70**, 467.

PERCY EDWARD HEDGMAN TURNER
M.D. Durh., D.P.H.

Dr. Percy Turner, founder of the Catherine Booth Hospital at Nagercoil in South India and a former chief medical officer of the Salvation Army, died on Oct. 19 at the age of 85.

He was brought up in the Church of England, but joined the Salvation Army, then in its early days, while he was a student at Barts. He qualified in 1893, and the following year he was awarded the Brackenbury scholarship in medicine. Soon afterwards he entered the Salvation Army training college for officers, and for the next few years he commanded corps in Dartford, Forest Hill, and Lewisham, becoming wholly engrossed in this ministerial work.

The opportunity then arose to share in the medical missionary work of the Salvation Army. He decided that for work of this kind he would need higher qualifications. He took a medical appointment while he studied for his matriculation, and then in successive six months took the 1st, 2nd, and final M.B. examinations, completing his degree in 1898. The same year he was awarded the Luke Armstrong scholarship in comparative pathology, and the following year the Stephen Scott scholarship in surgery. He also took the D.P.H. in 1899.

In 1900 he left for India and began to transform the dispensary at Nagercoil into a general hospital—the Catherine Booth Hospital. Later he formed branch hospitals in charge of Indian doctors who were trained by him in a seven-year course. Their final qualification in medicine was recognised by the government of Travancore, for at that time there was no medical college in the State. During his first furlough, in 1909, he took the M.D. Durh.

In 1923 he returned to England and became chief medical officer at the international headquarters of the Salvation Army in London. He held this post until he retired in 1937. He wrote a manual on tropical medicine for the use of Salvation Army officers. He represented the Salvation Army on the committee of the Medical Missionary Association, London, and the Public Morality Council.

A colleague writes: "At the beginning of his association with the Salvation Army Dr. Turner experienced much opposition, but he was always convinced that he had done the right thing in joining this organisation; his faith was simple but inspiring; he was gentle, courteous, and kind, and a true Christian gentleman in the highest sense of the word."

In 1902 Dr. Turner married Minnie Magyer, a nurse, who died in 1948. His only daughter died in 1952, and he is survived by his two sons, one of whom is a doctor.

Appointments

BOYD, J. M., M.B. Glasg., D.P.H.: whole-time senior asst. M.O.H., Fife.
BRUNTON, D. P., M.B. Glasg., D.P.H.: asst. M.O.H., Gloucestershire.
CAREW, NORAH, M.B. N.U.I., D.P.H.: asst. M.O.H. and school M.O., Croydon.
CHURCHILL-DAVIDSON, H. C., M.D. Camb., D.A.: anæsthetist (consultant), Chelsea Hospital for Women, London.
DUNCAN, MARGARET, M.B. Edin.: school M.O., Derby.
GILLIAT, R. W., M.A., D.M. Oxfd, M.R.C.P.: asst. physician for diseases of the nervous system, The Middlesex Hospital, London.
HALL, F. J. S., O.B.E., M.B. Lond., F.R.C.S.: appointed factory doctor, Deal, Kent.
HUNT, F. T., M.B. Lond.: school M.O., Derby.
MCVITIE, G. E., M.B. Edin.: appointed factory doctor, Keswick, Cumberland.
MOSELHI, ABDULLA, F.R.C.S.E.: senior casualty officer, Gateshead and district H.M.C.
PLEWS, W. R., L.R.C.P.E., D.OBST., D.P.H.: M.O.H., Stoke on Trent.
SPALDING, JOHN, M.A., D.M. Oxfd, M.R.C.P.: part-time consultant and research neurologist, Radcliffe Infirmary, Oxford.
SPELLER, P. J., M.B. Brist., D.P.H.: asst. M.O.H., Gloucestershire.
WHARTON, RALPH, M.B. Lpool: asst. M.O.H., Barrow-in-Furness.
WILLIAMS, E. A., F.R.C.S., M.R.C.O.G.: part-time consultant in obstetrics and gynæcology, Banbury and district H.M.C.

South-Western Regional Hospital Board:

ELRICK, W. L., M.B. Melb.: surgical registrar, Cheltenham General, Eye and Children's Hospital.
GRAHAM, A. J., M.B. Aberd., D.P.M.: senior psychiatric registrar, Tone Vale Hospital, near Taunton.
HABIB, G. G., M.B., B.SC. Birm.: medical registrar, Bath group of hospitals.

Notes and News

FIRM FOUNDATIONS

IN 1635 Thomas Macy, of Chilmark in Wiltshire, settled in Newbury, Massachusetts. Some three hundred years later his descendant, Mrs. Walter Graeme Ladd, set up in memory of her father the Josiah Macy, jun., Foundation, to promote human welfare by assistance to scientific medicine and improved health care. She left her trustees free to adapt the Foundation's programme to the changing needs of medicine and health, but she expressed the hope that they would help to develop "the spirit which sees the centre of all its efforts in the patient as an individuality."

Dr. Willard C. Rappleye, president of the Foundation since 1942, in his review of its first twenty-five years,[1] has described its partnership with the scholars "who explore the outermost boundaries of knowledge." The strength of the independent Foundation, as he sees it, is its freedom to back its fancy. Unlike an official body it can risk money on an untested concept "that may open new windows on the scientific scene or may lead only to a blank wall." The Foundation has found the grant-in-aid the most useful tool in helping the enterprising worker. Encouraged by its founder's interest in the whole patient it has, for instance, offered ready and consistent support to psychosomatic medicine. Its interest in the whole life cycle has led it to sponsor studies in genetics, growth, maturation, and ageing. It has also fostered research into the emotional nature of human beings and into ways of helping people to live harmoniously together. The studies it has helped range from Prof. Karl Lorenz's work in Westphalia on innate behaviour patterns to Dr. John Bowlby's investigations into human infant-mother relationship at the Tavistock Clinic in London.

The Foundation has also done much for medical education, and here Dr. Rappleye's own work on the commissions on medical education (1932) and on graduate medical education (1940) were a notable contribution. The Foundation has been struck by the changing pattern of medicine; "forms and methods of medical care are rapidly evolving in unpredictable directions. The only clear fact is that there will continue to be change." In its view the growing complexity of medicine has made administration of crescent importance, and it has backed with counsel and money the institute of administrative medicine set up in 1952 by Columbia University.

To many people in this country the name of the Macy Foundation is perhaps best known through its conferences. The slim reports of these informal meetings allow the reader to eavesdrop, if a reader can eavesdrop, on the free and easy discussions of experts on topics which have ranged from cybernetics to liver injury.

An older but equally alert body, the Rockefeller Foundation, has also lately presented its accounts. In 1954 it allocated just over $19 million, of which $5 million went to medicine and public health. In his review [2] the president, Mr. Dean Rusk, has this year singled out for special mention the Foundation's experience in awarding fellowships. This began in 1914 when four Chinese doctors began their advanced foreign training as Rockefeller fellows. Since then 7000 fellowships have been awarded to men and women from 92 different countries and territories. In retrospect Mr. Rusk thinks that no investment has been more rewarding. "Collective terms like 'mankind,' 'public health,' 'increased production,' and 'international understanding' encompass but often conceal real people. Improved medicine means, among other things, more and better trained nurses and doctors." The Rockefeller fellowships by offering extra stimulation and help beyond the limits of formal training have given us many able and competent scientists in the places where they are most needed.

VIRUS SYNTHESIS

A REPORT [3] from California tells of the partial synthesis of a virus. Under the direction of Dr. Wendell Stanley, two research-workers of the University of California, Dr. Heinz Fraenkel-Conrat and Dr. Robley Williams, have been studying the tobacco-mosaic virus and they have been able to break down the living viruses into inanimate parts and then reconstitute these so as to recover the same viruses as they started with. An announcement from the university pointed out that if one self-duplicating system could be made from inert material, it might be possible to reproduce other self-duplicating systems, such as chromosomes. The reconstruction of immunity-producing viruses might have far-reaching effects in preventing disease.

ELECTRONIC STETHOSCOPE

AN electronic stethoscope which magnifies heart sounds and murmurs is a necessity for the deaf physician and should be of help in detecting faint sounds or murmurs to those with normal hearing. The 'Maico Stethetron' is made by a well-known American manufacturer of hearing-aids. In use it is most convenient. The microphone is built on to the amplifier (partly operated by transistors), the whole measuring $10^1/_2 \times 4^1/_2$ cm., and the chestpiece is as conveniently applied as that of an ordinary stethoscope. The instrument is connected by electric flex to a crystal earpiece which is fixed to a very well designed stethoscope headpiece. There are three filter positions, but only the one with low frequency attenuation is of much clinical value. Unfortunately, if the volume control is turned too far there is a good deal of distortion which gives the impression of heart murmurs when these are absent. Faint aortic diastolic murmurs can be heard about as well as with an efficient diaphragm stethoscope, and in one case such a murmur was heard a trifle more easily. The microphone is a great advance on those previously available because it is sensitive only on actual contact and so does not readily pick up extraneous room noise.

This instrument is a considerable improvement on previous devices of this sort and should be a great help to the deaf. With some modification it might prove of value to all physicians, but unfortunately at 80 guineas it is rather expensive. It is marketed in Britain by Messrs. R. Camrass & E. Dayne, 71, Portland Place, London, W.1.

THE PORTUGUESE EXHIBITION

THE winter exhibition of the Royal Academy which opened last week, shows us this year the arts of Portugal. Though not large it is comprehensive and varied; sculpture, paintings, faience, tiles, gold and silver plate, embroideries, carpets, furniture, even a gilded coach have all been gathered at Burlington House. Their selection and arrangement is the work of Prof. Reynaldo dos Santos, president of the National Academy of Fine Arts of Lisbon, and an honorary fellow of the Royal College of Surgeons of England. The exhibition is open on weekdays from 10 A.M. to 7 P.M., and Sundays from 2 P.M. to 6 P.M., until Feb. 19.

University of London

Mr. C. H. Barnett, senior lecturer at St. Thomas's Hospital Medical School, has been appointed to the university readership in anatomy at that school. Dr. R. S. F. Schilling, reader in the Nuffield department of occupational health in the University of Manchester, has been appointed to the university readership in occupational health at the London School of Hygiene and Tropical Medicine.

University of Liverpool

Prof. R. I. Harris, formerly associate professor of surgery (orthopædics) in the University of Toronto, will deliver the Lady Jones lecture in orthopædic surgery on Wednesday, Nov. 16, at 5.15 P.M. at the Medical School. He will speak on Hypermobile and Rigid Flat Feet.

University of Aberdeen

On Oct. 26 the degree of M.D. with honours was conferred on N. S. Clark and A. D. Morgan.

National University of Ireland

The degree of M.D. has been awarded to M. L. Conalty.

College of General Practitioners

On Saturday, Nov. 19, at 11.30 A.M. at B.M.A. House, Tavistock Square, London, W.C.1, Dr. G. O. Barber will deliver the second James Mackenzie lecture, when his subject will be Medical Education and the General Practitioner. On Sunday, Nov. 20, at 10 A.M. at the Imperial Hotel, Russell Square, W.C.1, a symposium will be held on the Position of the General-Practitioner Obstetrician Today. The speakers will be Dr. E. B. Hickson, Prof. W. C. W. Nixon, and Mr. A. J. Wrigley.

1. The Josiah Macy Jr. Foundation, 1930–55. Published by the Foundation, 16, West 46th Street, New York 36.
2. The President's Review from the Rockefeller Foundation Annual Report, 1954. Published by the Foundation, 49, West 49th Street, New York.
3. *Manchester Guardian*, Oct. 29; *Times*, Oct. 31.

Royal College of Physicians of London

At a comitia held on Oct. 27, with Sir Russell Brain, the president, in the chair, Dr. K. Shirley Smith, Dr. A. A. Moncrieff, Dr. W. S. C. Copeman, and Dr. William Brockbank were elected councillors; Dr. A. Feiling was re-elected representative on the committee of management; Sir Russell Brain, Sir Harold Boldero, Dr. W. G. Barnard, Sir Allen Daley, and Dr. A. M. Cooke were re-elected members of the standing joint committee of the three Royal Colleges; and Dr. C. A. Keele and Dr. Donald Hunter were reappointed representatives on the Joint Formulary Committee. Dr. D. D. Reid was appointed Milroy lecturer for 1957. His subject is to be Environmental Factors in Respiratory Disease.

The following candidates, having satisfied the censors' board, were admitted to the membership:

Ahmad Ali, M.B. Punjab, Harry Barkley, M.B. Lond., M. C. Brain, B.M. Oxfd, Winifred Burgess, M.B. Lond., Mani Kumar Chhetri, M.D. Calcutta, E. N. Coomes, M.B. Lond., R. F. P. Cronin, M.D. McGill, C. J. Dickinson, B.M. Oxfd, Lieutenant R.A.M.C., D. E. Dunn, M.B. Adelaide, P. W. Dykes, M.B. N.Z., Peter Ebeling, M.D. Melb., Prudence A. Fitzgerald, M.B. N.Z., John Fraser, M.B. Lond., R. B. Gove, M.B. Aberd., J. H. Hale, M.D. Birm., R. H. Jackson, M.C., B.M. Oxfd., E. H. Jellinek, B.M. Oxfd., E. M. Jepson, M.B. Lond., Trambaklal Bhailal Kasudia, M.B. Bombay, D. F. King, M.D. Melb., M. H. King, M.B. Camb., R. C. Lambert, M.B. Birm., J. G. Lewis, M.B. Lond., Colin McCance, M.B. Camb., D. A. F. McGill, M.B. Lond., P. G. F. Nixon, M.B. Durh., J. D. K. North, M.B. N.Z., H. G. Penman, M.B. Camb., H. A. J. Reay, M.B. Edin., Captain R.A.M.C., R. E. Richardson, L.R.C.P., V. M. Rosenoer, M.B. Lond., R. S. F. Schilling, M.D. Lond., D. N. Seaton, M.B. Camb., Olive Sharpe, M.B. Sheff., P. D. Swinburn, M.B. N.Z., Joan Yell, M.B. Durh.

Licences to practise were conferred upon the following 118 candidates who had passed the final examination of the conjoint board:

John Aaron, James Adams, R. J. W. Adamson, Anne Ambrose, J. P. H. Anderson, J. T. Andrews, M. R. H. Ashken, George Atkins, J. S. Bagnall, J. R. Batchelor, A. E. Bennett, Marian Bevan, A. T. Birmingham, J. W. Blaxland, J. R. F. Boger, W. A. Boyle, A. E. Boyo, A. A. Buchanan, R. M. Buckle, S. T. G. Butterworth, W. C. Canning, B. P. Carroll, Audrey L. Carus, W. D. Chalmers, Jay-Gopal Chitnis, J. M. Clark, J. R. T. Colley, J. L. Croft, Peter Curzen, Rosemary L. Dart, W. B. Davies, David de Souza A. R. Dewsbury, Dorothy M. H. Dickinson, M. N. G. Dukes, W. R. O. Eggington, C. D'Arcy Ellis, Judith F. Farrar, Hilary K. J. Fisher, T. I. M. Furniss, J. F. Garner, Elizabeth P. Gibbs, N. W. Glendinning, John Goulton, P. J. Gregory, P. H. Gwynne, P. A. Halford, W. H. H. Hamilton-Deane, Margaret E. Happold, Thomas Hargreaves, G. C. B. Hawes, R. I. Henry, Sylvia K. Hepton, Mary Higginbottom, A. H. Hodson, G. P. Holden, G. I. Horsfield, P. J. E. Hubbard, Rachel E. Hudson, Warwick Hutchings, A. C. Ikeme, W. D. Jeans, R. B. Jenkins, Janet R. C. Jones, Margaret L. L. Jones, R. P. Jordan, L. W. Kay, J. F. Keighley, R. A. Lacey, D. M. Lasman, R. H. Lavelle, Wai-Hing Lee, A. W. F. Lettin, A. F. Lever, Alexander Livingston, Dawn C. M. Llewellyn, J. H. L. Lloyd-Thomas, J. C. McAlpine, Moira A. McLellan, H. R. T. A. McLeod, A. J. Martin, K. D. F. Martin, R. H. Martin, T. C. E. Mbanefo, J. W. Mellows, H. F. Molloy, J. E. U. Moxon, J. E. Newcombe, Margaret E. Noad, P. O. Nwachukwu, E. D. A. Ormsond, Idris Owen, M. A. Pallister, Katrina M. Parry, Joyce M. Pearce, P. O. Reeves, E. F. Rice, Joan M. Ridley, E. C. Smart, R. B. F. Smith, D. H. Somervell, M. B. Stanton, H. M. Swallow, Marian A. Taylor, J. G. Tees, J. S. Toner, Shirin Abdulhussein Visram, P. F. Wale, A. R. Walker, Alison S. Wallace, Jean M. Watkins, Ivan Weisz, J. D. W. Whitney, Marie P. Wigmore, Mary E. Wood, J. A. Wright, B. C. Wyatt, Janet C. J. Young.

Diplomas in child health were conferred on those named in the report of the Royal College of Surgeons in our issue of Oct. 22 (p. 884). The following diplomas were also conferred:

D.L.O.—Mohamed Hassan Ashruff.

D.M.R.T.—Kirikankanange Mahondrapala Chandrasena de Silva, D. J. Duffy, D. N. Edwards, J. F. Filbee, J. B. A. Healy, Jessie L. Hood, K. M. Jones, L. M. Liegner, R. J. M. Whittle.

Addingham Medal

This medal, which is awarded for "the most valuable discovery for relieving pain and suffering in humanity," has been given this year to Mr. A. T. Glenny, F.R.S., formerly head of the immunology department of the Wellcome Foundation, for his work on immunisation for the prevention of diphtheria.

Royal Society of Health

On Wednesday, Nov. 16, at 11 A.M., at 90, Buckingham Palace Road, London, S.W.1, there will be a sessional meeting of this society on the Design of Health Buildings. The speakers will include Dr. C. W. Gordon and Dr. A. B. Stewart.

Handbook for General Medical Practitioners.—The Ministry of Health have issued a new edition of this handbook, revised to March 31, 1955.

Births, Marriages, and Deaths

BIRTHS

JARVIS—On Oct. 31, at Southmead Hospital, Bristol to Valerie, wife of Dr. D. J. A. Jarvis—a son.

Diary of the Week

NOV 6 TO 12

Monday, 7th

POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12
4 P.M. Dr. Dermod MacCarthy: Hypertension in Childhood.

SOCIETY OF APOTHECARIES OF LONDON, Black Friars Lane, E.C.4
4.30 P.M. Dr. R. S. F. Schilling: Byssinosis.
5.45 P.M. Dr. A. J. Amor: Industrial Hazards.

Tuesday, 8th

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.) Dr. O. G. Edholm: Effects of Cold on Man.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1
8 P.M. *Psychiatry.* Dr. L. Z. Cosin, Dr. John Watkin, Dr. Felix Post: Geriatric Problems in Psychiatry.

INSTITUTE OF NEUROLOGY
5.30 P.M. (National Hospital, Queen Square, W.C.1.) Dr. M. McArdle: Facial Pain.

INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5.30 P.M. Dr. R. H. Meara: Skin Testing.

ST. MARY'S HOSPITAL MEDICAL SCHOOL, Paddington, W.2
5 P.M. Dr. W. Hawksworth: Clinical Value of X-ray Pelvimetry.

MANCHESTER MEDICAL SOCIETY
8 P.M. (Medical School, University of Manchester.) *Surgery.* Mr. Henry Thompson: Anal Fissures and Fistulæ.

Wednesday, 9th

ROYAL SOCIETY OF MEDICINE
4.30 P.M. *Physical Medicine.* Prof. F. J. Nattrass, Dr. J. Walton, Dr. P. Bauwens, Dr. A. T. Richardson: Clinical and Electromyographic Aspects of Polymyositis.

POSTGRADUATE MEDICAL SCHOOL
2 P.M. Dr. Paul Fourman: Salt and Water Metabolism.

INSTITUTE OF DISEASES OF THE CHEST, Brompton Hospital, S.W.3
5 P.M. Mr. O. S. Tubbs: Mitral Valvotomy.

INSTITUTE OF ORTHOPÆDICS
8 P.M. (Royal National Orthopædic Hospital, W.1.) Prof. R. I. Harris (Toronto): Syme's Amputation.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. H. Haber: Squamous-cell Epithelioma.

ST. MARYLEBONE HOSPITAL FOR PSYCHIATRY AND CHILD GUIDANCE, 48, Cosway Street, N.W.1
5.30 P.M. Dr. G. Parsons-Smith: Value of the Electro-encephalogram in Clinical Psychiatry.

OXFORD UNIVERSITY
5 P.M. (Radcliffe Infirmary.) Prof. Carl Semb: Partial Resection of the Kidney.

MANCHESTER MEDICAL SOCIETY
4.30 P.M. *Pathology.* Dr. K. McCarthy: Recent Laboratory Work with Measles Virus.

Thursday, 10th

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.1
5 P.M. Dr. Denis Williams: Emotions Arising in Epileptic Attacks.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.2
5 P.M. Prof. L. Deloyers (Brussels): Description and Justification of a New Curative Operation for Peptic Ulcer—Reversed Gastrectomy.

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. Dr. A. C. Dornhorst: Physiology of Lower Œsophagus and Cardia.

ROYAL SOCIETY OF MEDICINE
5 P.M. *Ophthalmology.* Mr. Frederick Ridley, Mr. A. G. Leigh, Mr. H. Ridley, Mr. B. W. Rycroft: Keratoconus.

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
3 P.M. (Chelsea Hospital for Women, S.W.3.) Prof. A. M. Claye: Dyspareunia.

SOCIETY OF APOTHECARIES OF LONDON
4.30 P.M. Sir Clement Price Thomas: Surgical Treatment of Pulmonary Tuberculosis.
5.45 P.M. Dr. Clifford Hoyle: Medical Treatment of Pulmonary Tuberculosis.

ALFRED ADLER MEDICAL SOCIETY
8 P.M. (11, Chandos Street, W.1.) Dr. J. C. Sawle Thomas: Psychiatric Administration.

UNIVERSITY OF EDINBURGH, University New Buildings, Teviot Place, 8
5 P.M. Dr. C. R. S. Jackson: The Ageing Eye. (Honyman Gillespie lecture.)

UNIVERSITY OF ST. ANDREWS, Queen's College, Small's Wynd, Dundee
5 P.M. Prof. H. G. Callan, D.SC.: The Structure of Chromosomes.

Friday, 11th

POSTGRADUATE MEDICAL SCHOOL
2 P.M. Mr. J. A. C. Fleming: Irradiation Injuries in Clinica Practice.
4 P.M. Dr. J. B. Gaylor: Facial Pain.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. H. J. Wallace: Eczema.

ROYAL COLLEGE OF PHYSICIANS, Edinburgh, 2
5 P.M. Dr. C. A. H. Watts: Neuroses in General Practice. (John Matheson Shaw lecture.)

Saturday, 12th

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY
11.15 A.M. (Queen Charlotte's Hospital, Goldhawk Road, W.6.) Prof. Ian Donald: Pitfalls in Forceps Delivery.